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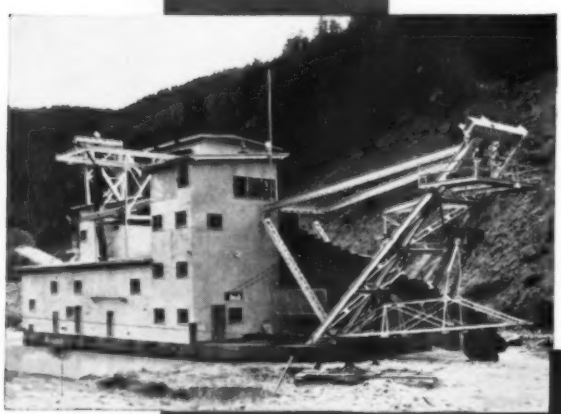
EXCAVATING ENGINEER

FOUNDED 1905

• Andrew Ansaldi Co. sold and delivered 35,000-cu. yds. of fill from this basement excavation in Manchester, Conn. Using shovel and dragshovel combinations, the job was completed in 36 eight-hour days.

ol. XL August, 1946 Number 8

Use Bucyrus-Erie Experience in Equipping Your Dredging Operation



WHETHER your needs call for replacement of lost, damaged, or obsolete dredging equipment or for resumption of war-deferred equipping of new properties and projects, Bucyrus-Erie **experience** is ready, as always, to serve you to your advantage. More than 65 years of providing equipment for many of the world's underwater and dryland excavating and mining activities, large and small, have proved Bucyrus-Erie's ability to produce excavating and dredging equipment that is "years ahead" in output and operating economy — the two factors that mean the most to successful resumption of peacetime dredging activities.

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Dipper } **DREDGES**
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SOUTH MILWAUKEE, WISCONSIN

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BUDA *since 1910 powering . .*

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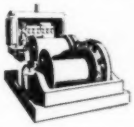

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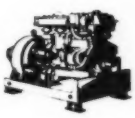

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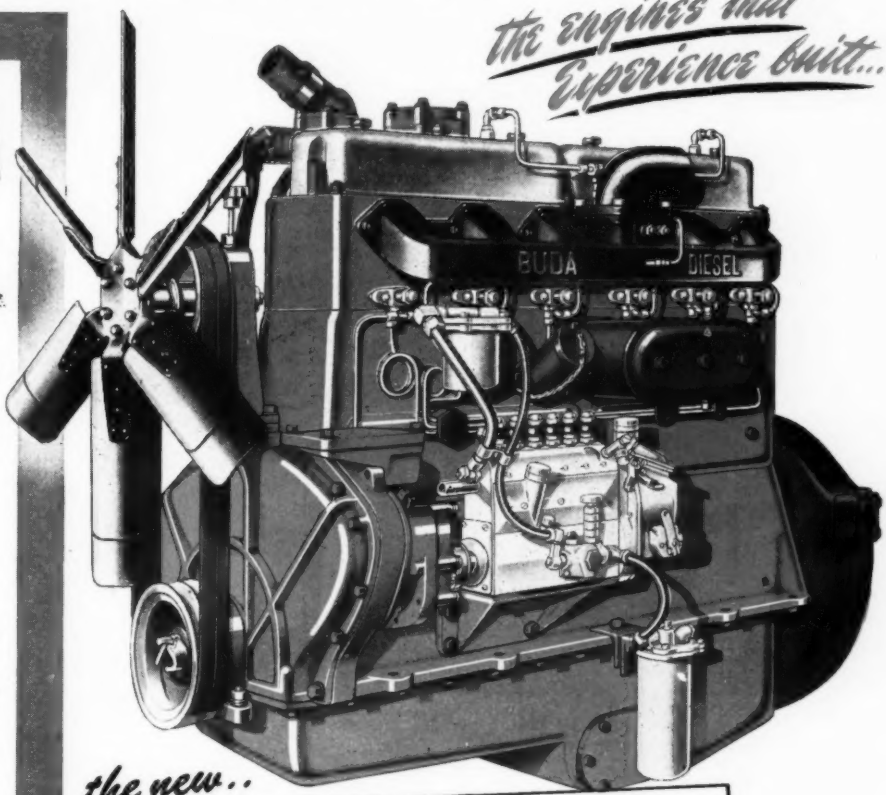

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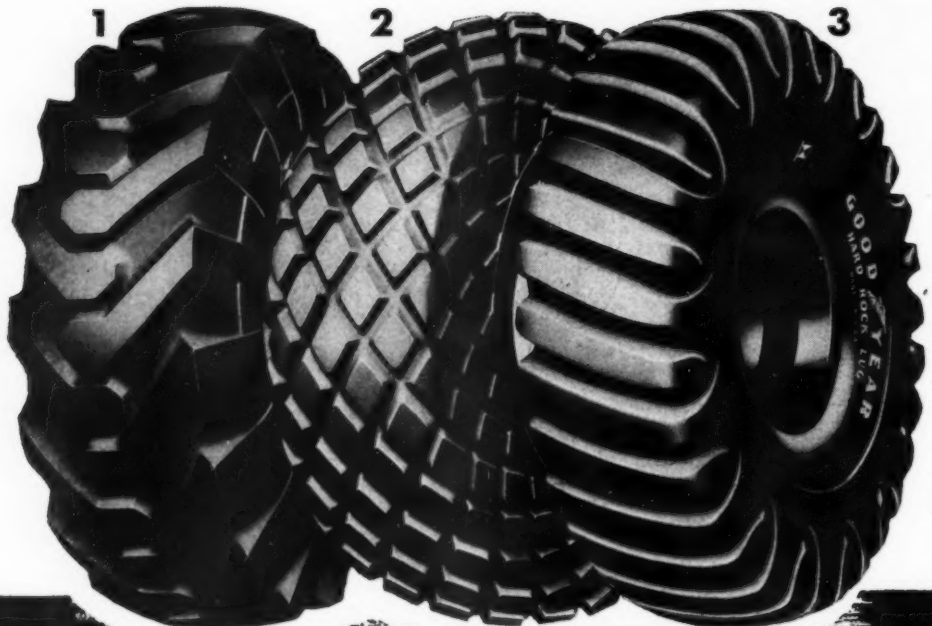

1
SURE-GRIP EARTH MOVER
— super-traction for drive wheels on all soils (left)

2
ALL-WEATHER EARTH MOVER
—sure-roll for drawn vehicles and for general traction (center)

3
HARD ROCK LUG
— super-armored for all rough and rugged rock work

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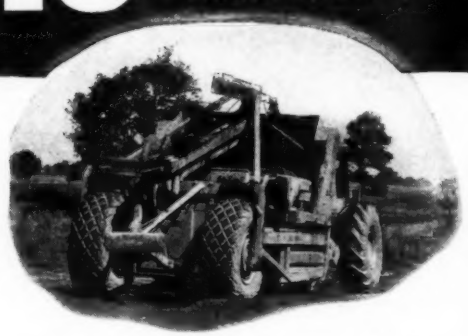

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EXCAVATING ENGINEER

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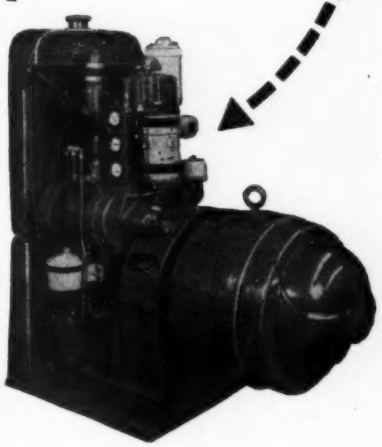
Nothing Extra to Buy



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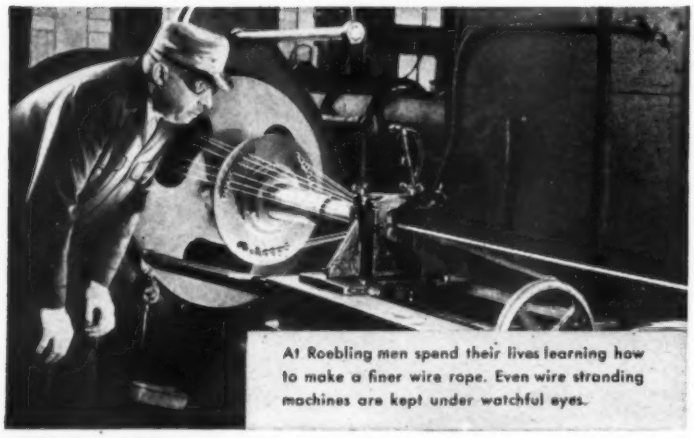
the right Wire Rope



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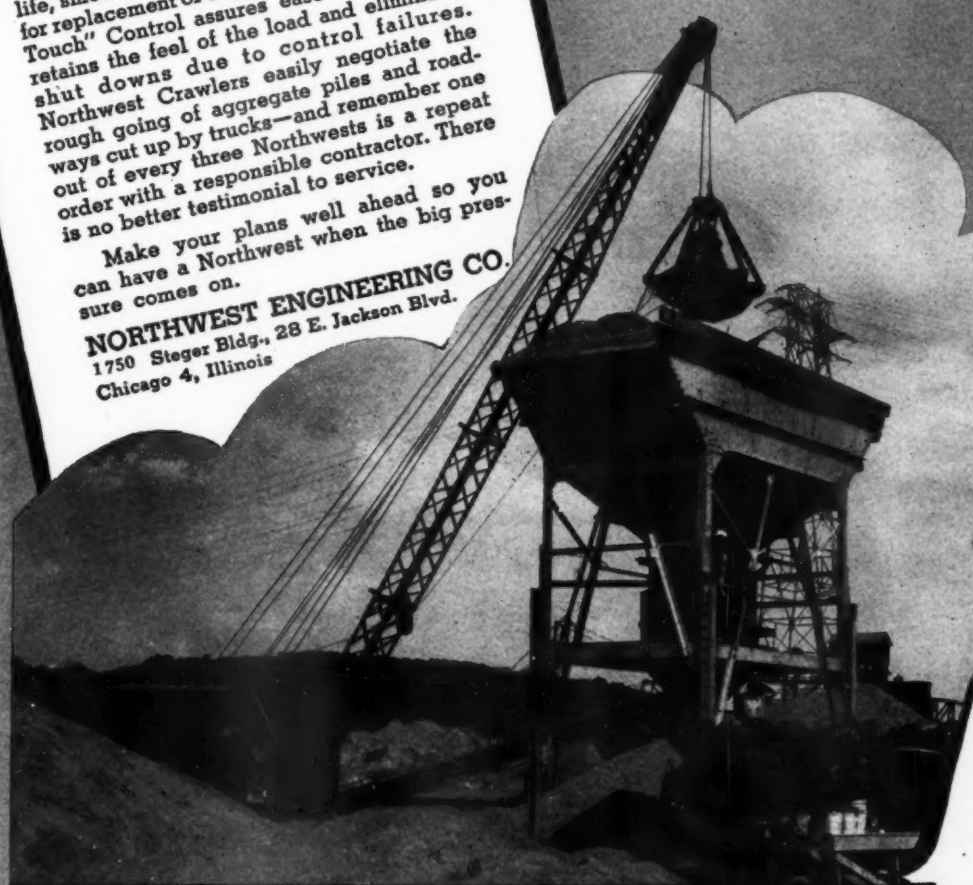

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Remember — there is no substitute for the real thing!

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time where it counts the

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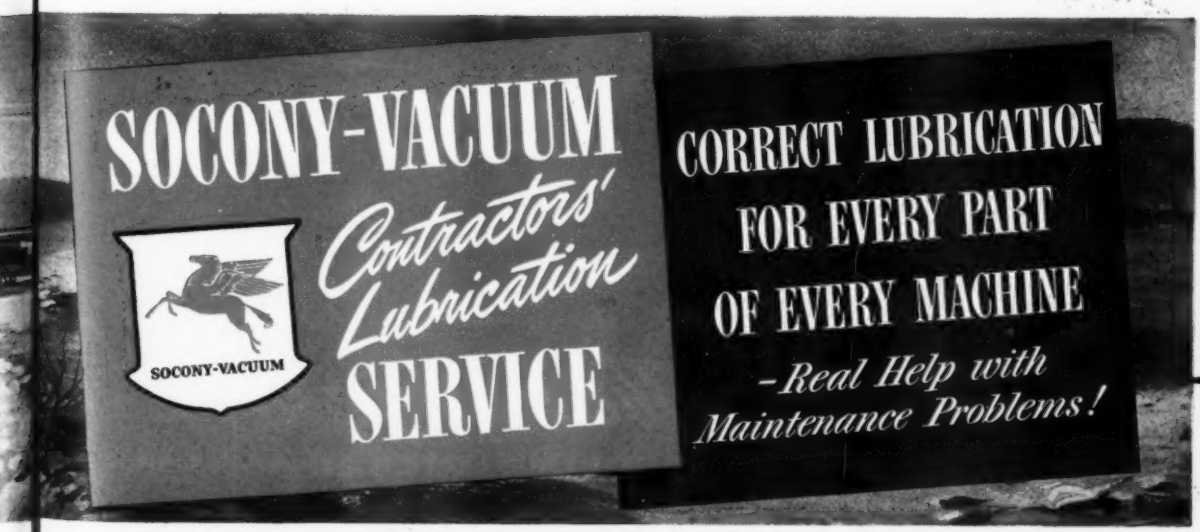
hy Be Satisfied Merely With "Gas and Oil" When You Can Get Complete Service!



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EVERY HOUR

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SOUTH MILWAUKEE, WISCONSIN

COST-CUTTING METHOD KINGSLEY

Pit is tough loading material mostly sand in small hillocks.

TOBIN QUARRIES USE 3 TOURNAPULLS to strip gravel pockets . . . then same rigs load out the sand and gravel, dump to conveyor and haul away waste sand in one cycle of operation

At Kingsley Dam, north of Ogallala, Nebraska, Tobin Quarries of Kansas City took the contract to produce ¼" to 2½" gravel for filter face under rip-rap to prevent washing. Hills of sand, clay and gravel were scattered over 2 square miles of pit area. Gravel formations were spotty, ran from 2 to 10 ft. deep, carried a large percentage of sand. A fast, low-cost recovery method was needed to bring material to the plant. Tournapulls solved the problem.

These high-speed, rubber-tired rigs strip the knolls, then load gravel mixture and haul to grizzly, dump onto conveyor belt which feeds the plant. Screened gravel is bin-loaded to trucks for haul to dam face. Tournapulls pull around under hopper, are loaded with waste sand, which is hauled back to mined-out areas and dumped.

Haul loaded both ways, make 4000-foot cycle in 11½ minutes

Tournapulls are making round trip haul of 4000 ft. in 11½ minutes, hauling pit run gravel to plant, returning with waste sand to pit. They are pusher loaded in 1 minute; haul 2000' to plant, half of it up-grade, in 3¼ minutes. Dumping to grizzly takes ¾ minute; loading waste sand from hopper 1¾ minutes; hauling and dumping sand 2¾ minutes; return to pit 2 minutes.

Tournapulls saved 8 minutes per trip

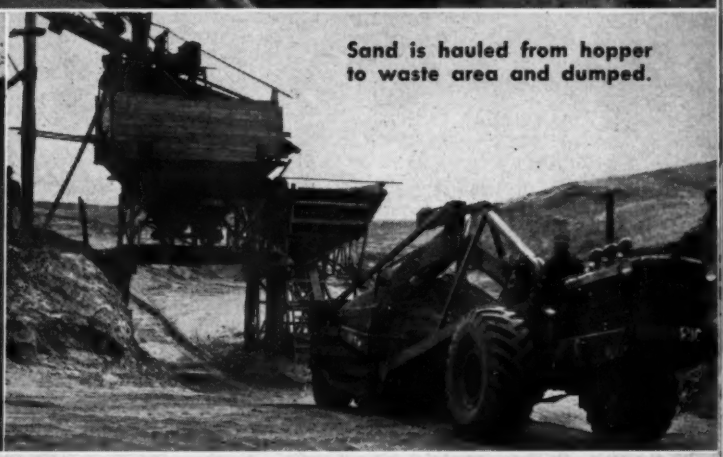
Early in the job, Tobin Quarries compared Tournapull production with crawler-drawn scrapers . . . found a Tournapull made round trips in 10 minutes compared to 18 minutes for the crawler tractors and scrapers. Because of this 8 minutes saved per trip, with resulting increased production, 2 additional rubber-tired, high-speed Tournapulls were brought onto the job. The 3 Tournapulls now supply enough material to keep the 200-ton-per-hour screening plant in continuous operation.

Check your materials-handling for similar savings

Ask your LeTourneau Distributor for an analysis of the savings possible with modern high-speed Tournapulls. Let him show you how they can cut costs on your jobs.

used to supply
DAM GRAVEL PLANT...

Tournapull dumps from trestle through grizzly to conveyor.



Sand is hauled from hopper to waste area and dumped.

Above: Plant hopper reloads Tournapull with waste sand. Second hopper loads gravel for truck haul to dam.

Below: Whole operation is over rough country; haul road crosses this gully on fill, also crosses a main highway.

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PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

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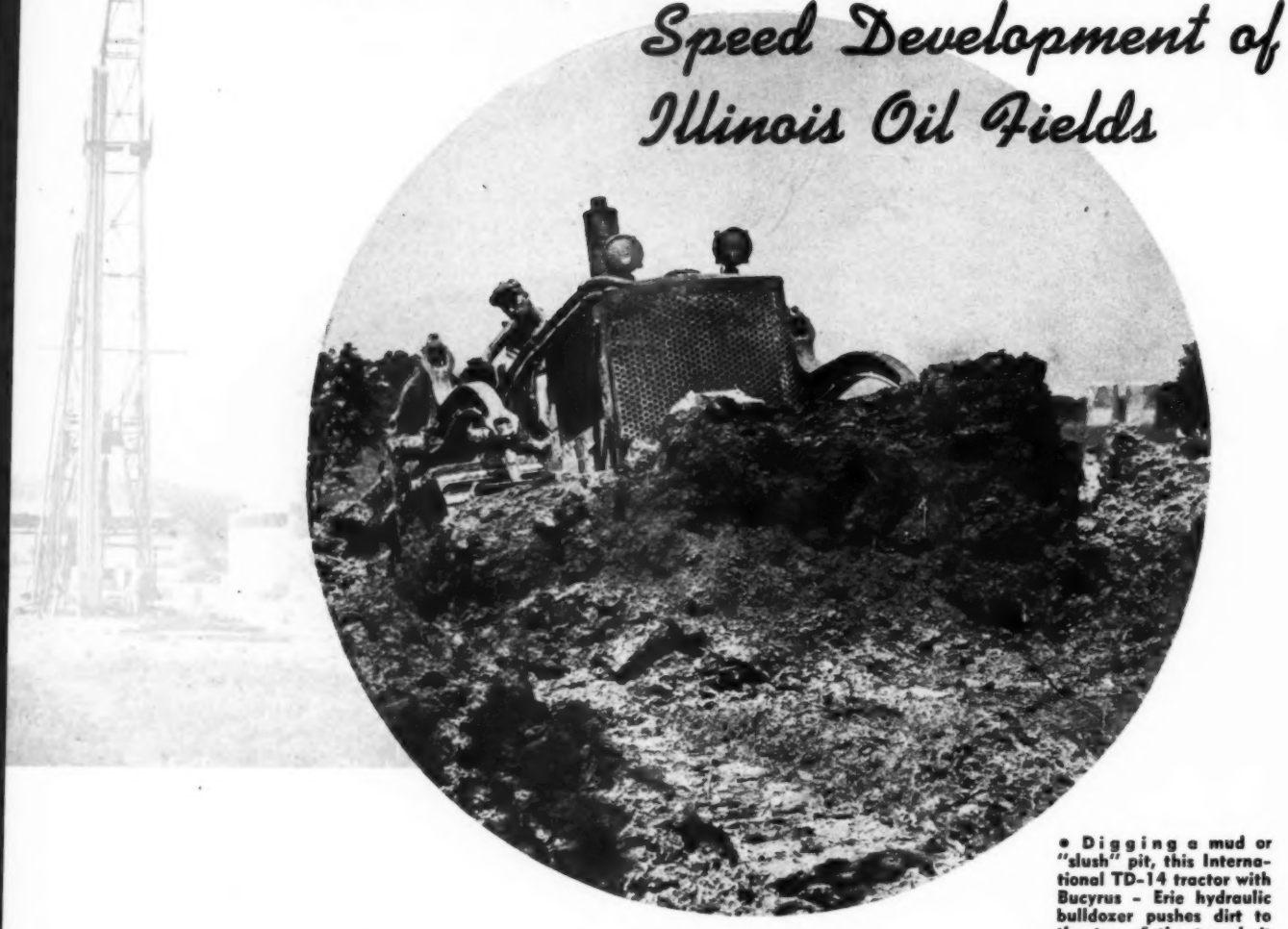
BULLDOZERS

Speed Development of Illinois Oil Fields



• Digging a mud or "slush" pit, this International TD-14 tractor with Bucyrus - Erie hydraulic bulldozer pushes dirt to the top of the trough it has previously dug.

Contractors in the new Mattoon and Brownsville fields use bulldozers as ever-busy handy men in oil drilling and production operations

CALLING BULLDOZERS the new oil field "roughnecks" may steal some of the thunder from helpers around a drilling rig, to whom the term has been applied as far back as oil field men can remember. But it also scores a bull's-eye for accuracy, judging from the oil fields of Illinois, because in those fields the roughest, toughest kind of work goes to these tractor-and-blade combinations.

In operation seven days a week and averaging 12 to 14 hours a day, bulldozers in the new Brownsville and Mattoon fields scurry around from job to job with only the briefest of time outs for maintenance. Usually working alone on any one location, a single 'dozer often sees as many as three drilling sites in a day, having a hand in every oil field operation except the actual drilling. It digs pits, pioneers haul roads, clears and grades drilling sites, builds fire walls, and, equipped with a sturdy oil field winch, hauls and skids heavy equipment through the worst kind of mud you can find anywhere—oil field mud.

Taking a single oil location and following it through from beginning to end, you find the bulldozer entering significantly into the picture repeatedly—and when it's not on the scene, you can safely bet that it's on another oil job nearby.

Access Road to Site

First comes the job of roughing out an access road to the drilling site, an operation that often means clearing away brush and small trees. Next, the spot where the drilling rig is to be set up must be leveled and smoothed. Sometimes a considerable amount of dirt must be moved to form a solid substructure base for the drilling rig. A perfectly level, solid surface is extremely important to successful drilling because the derrick must be absolutely per-

pendicular to permit drilling a plumb hole.

Digging Pits

Another important phase in the preparation of the drilling site is the digging of pits—usually three in number—for use in the drilling operation. Rotary drilling ordinarily requires two mud pits and a saltwater pit. One of the pits holds a mixture of special drilling mud, usually a barium or bentonite product mixed with water which in drilling is pumped down through the hollow drill stem and up around the stem back into the pit. Thus a constant circulation of mud is maintained and by this means the cuttings in the bottom of the drill hole are carried out of the hole and disposed of. The circulating mud also prevents caving of the hole, eliminating the need for casing the hole during drilling.

The second mud pit, also holding drilling mud, is in the nature of a reserve that can be called on should circulation be lost through a rock fissure encountered in drilling. When circulation is lost, the mud quickly drains away and plenty of reserve mud must be ready for use.

The two mud pits are usually located side by side and are of identical dimensions. In the Brownsville and Mattoon fields these pits are about eight feet wide, 50 feet long, and five to six feet deep—each pit involving from 75 to 90 cubic yards of excavation. In constructing these pits, the bulldozer operator establishes both the width and length dimensions by making straight-ahead cuts to a distance of 50 feet, the blade cutting the pit to proper width. As the pit becomes progressively deeper, its sides act as a trough permitting the 'dozer to carry big pay loads ahead of the blade. The operator first makes repeated cuts in one direction until one end is cut to proper depth, then reverses the 'dozer to dig out the opposite end.

Salt Water Pit

The saltwater pit used for disposal of salt water after the well is drilled, is usually considerably more shallow than the mud pits, but is wider; dimensions are usually in the neighborhood of 50 feet square and 2½ feet deep, amounting to about 200 cubic yards of material excavated. The bulldozer builds this type of pit by making both lengthwise and crosswise cuts, pushing the dirt outward to form a wall of the desired height.

The total pit excavating job (all three pits) amounts to anywhere from 300 to 400 cubic yards. A single bulldozer handles this work in three to five hours. Charges for a set of pits run from $100 to $150.

Haul Equipment

With the drilling site prepared, the bulldozer-equipped tractor is often called on to help haul in equipment—skidding the heavy drilling machinery or draw works on the winch line, winching out mired trucks, pulling in work shanties or "dog houses".

During the actual drilling operation, the bulldozer is off the location, to return later for backfilling the pits. The length of time required for drilling a well varies according to the necessary depth, the kind of formations encountered, and the drilling "luck". In the Mattoon field, wells average in

• A series of lengthwise cuts with Baker bulldozer—first in one direction, then in the opposite—results in a six-foot deep pit used by oil well drillers for holding drilling mud.

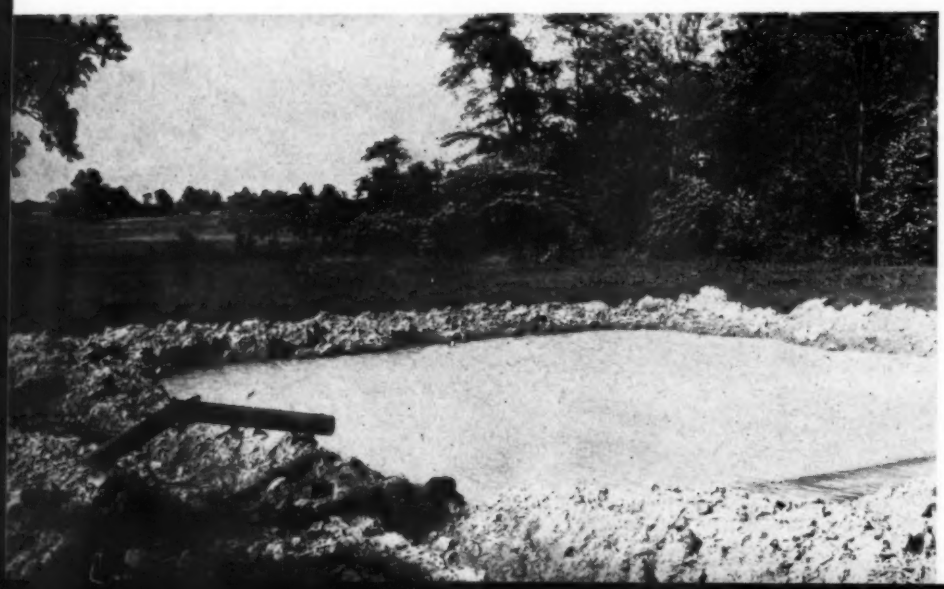
• With a rotary drilling rig in the background, an International TD-14 and Bucyrus-Erie bulldozer (above, left) grades a county oil road. (above, right): Caterpillar D-7 tractor equipped with LaPlant - Choate bulldozer with special blade fills in slush pit. The Bucyrus-Erie blade at the left clears the brush for an access road.

depth about 2000 feet and require as little as a week for the rotary drilling.

Most of these wells are not "finished" with rotary drilling machines. That is, they are drilled to a point just above the oil-bearing formation with rotary rigs, but cable tool spudders, similar to churn drills used for blast hole drilling, handle the actual penetration of the oil formation —called "drilling in" or "tailing in". Use of spudders for this part of the drilling operation proves, generally, far more successful than does use of the rotary method. With spudders there is no necessity for circulating drilling mud and for this reason they can drill into the oil formation without running the danger of reducing oil production by plugging the porous oil formation with drilling mud. Spudders also aid production by setting up an agitation, through a process known as "swabbing" of the formation.

After the well is drilled and "tailed in", the bulldozer may be temporarily called on to help move drilling equipment out and pumping equipment in, although the latter can usually be handled by truck alone. Definitely a bulldozer job, however, is that of burying the accumulation of mud, oil, and salt water that occupies the pits after the well is drilled and pumping. To do this, the bulldozer merely backfills the material previously excavated, leveling the entire location so that in time the location bears some resemblance to its original contours except for the slowly nodding pump jack that relentlessly pumps out oil from the well and through a pipe line into a storage tank.

• Bulldozer dug, this finished pit contains salt water run off from a newly drilled oil well near Brownsville, Ill.



Placing Storage Tanks

The bulldozer also has a hand in the placing of oil storage tanks, first clearing and grading the tank site, later building a 2½ to 3-foot fire wall around the tanks. The wall acts as a breaker to any fire that may threaten to reach the tanks. It also acts as a reservoir when emergencies make it necessary to release the crude oil from the tanks—usually done to prevent explosions during fires.

Classified as to ownership and operating basis, the bulldozers working in the Illinois Basin oil fields are generally of two types: (1) machines owned by excavating contractors who specialize in oil field excavating and operate the machines on contract for drilling and producing companies; (2) machines owned by drilling contractors who operate them on their own locations and also contract jobs for their machines with

other drilling companies. The owner's operators accompany the machines on all jobs.

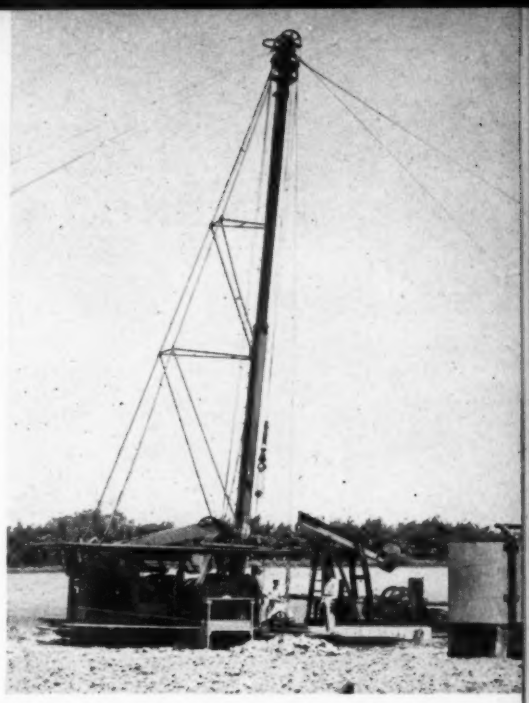
Typical of excavating contractors specializing in oil field work are Everett and Brown, located at Cisne, Illinois, but actively operating considerably farther south in the new Brownsville field in White County near Carmi. A new firm established almost simultaneously with the bringing in of the Brownsville pool discovery well in September, 1945, Everett and Brown are, respectively, Noel Everett and Ivan Brown.

Their excavating equipment consists, at present, of two bulldozer-equipped tractors: a wide gauge International TD-14 diesel tractor with Bucyrus-Erie hydraulic bulldozer and a standard gauge TD-14, also equipped with a Bucyrus-Erie hydraulic bulldozer. Like most tractors and trucks in the oil fields, each machine is equipped with a "headache" and an oil field winch. An example of oil field vernacular, a "headache" is a structure built from short lengths of pipe properly cut and welded together to form a rack which is mounted at the rear of the tractor. It has various uses, housing and protecting the winch, acting as a rack for holding various small tools, chains, etc., and serving as a kind of fore-shortened crane boom over which the winch line can be reeved for pulling. Both tractors are equipped with Braden Model 85 oil field winches—powerful units whose uses are almost numberless.

Hauling, Servicing Dozers

For hauling and servicing the bulldozers, Everett and Brown use a D50 International truck with a "lowboy" machinery trailer, and a Ford pickup truck. The International is equipped with a Braden winch and an oil-field type truck body with a headache rack, tail roller, and connection for the trailer. The bulldozers are transported on the lowboy.

With drilling proceeding at a fast pace in the Brownsville pool, Everett and Brown have no trouble keeping their equipment steadily producing for them. On the day their jobs were visited, the wide gauge TD-14 dug pits on a Pure Oil lease in the morning, then moved to another location just up the road for more pit work. Meanwhile the standard gauge TD-14 was trucked into the same area and put to work grading the right of way for a county road being built through the heart of the Brownsville field. The bulldozer smoothed off ruts in the roadway. Plans for the following day called for putting both 'dozers and trucks on new locations.



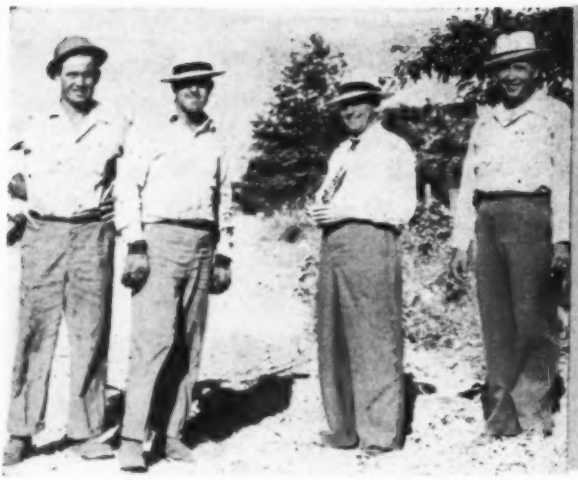
• Portable cable-tool drills, like this Bucyrus-Erie 36-L spudder, are widely used in the Illinois fields for development and servicing operations.

For each piece of equipment, Everett and Brown employ both an operator and a helper. Equipment is kept working long hours each day—sometimes as much as 36 hours at a stretch—because it's characteristic of oil field work that the job has to be done immediately as it arises.

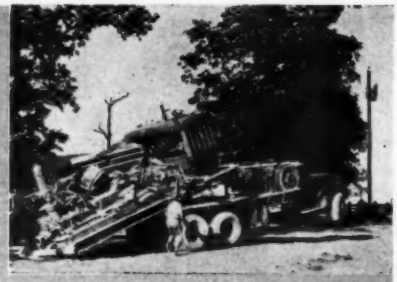
The bulldozer-equipped tractors are lubricated one to three times daily, depending on the kind of work and the duration of the job. When the 'dozers are working in mud and water they are greased three times a day; in dry conditions once or twice suffices. Pure Oil fuels and lubricants are used exclusively.

Three Way Drilling Company of Grayville, Illinois, affords an example of a drilling contractor owning a bulldozer and operating

• By means of special tracks fabricated from steel channels and pipe, (left) operator unloads one of Everett and Brown's bulldozers from the lowboy on which it is transported. Structure at back of tractor is a "headache" rack or post, housing a Braden oil field winch. (Below) Digging a slush pit in an Illinois oil field with Caterpillar D-7 tractor with La Plant-Choate bulldozer.



• On the scene of an oil location near Brownsville are (left to right) Contractor Noel Everett of Everett & Brown; T. V. Banks of Three Way Drilling Co.; E. W. Werner of E. W. Werner Motor Co., Salem, which specializes in 24-hour service to the oil fields, and Werner's assistant, George Creager.



• Part of the machinery for a rotary drilling unit is sucked up onto an oil field truck by means of a winch mounted behind the truck cab. Heavy weight of the machinery raises truck front wheels high off the ground.

it exclusively on oil field work. The machine is a standard gauge TD-14 International diesel tractor equipped with a Bucyrus-Erie hydraulic bulldozer. The company uses it on all of its own lease and pit work, filling in the off times by sending the 'dozer out on contract jobs for other drilling and producing companies.

The companies' operations at present are concentrated in the Mattoon field, a newly proved area which has seen intense activity since the discovery well revealed the new pool in October, 1945.

Three-Way's TD-14, like those of Everett and Brown, is equipped with a Braden winch and a pipe-fabricated headache. When witnessed by the writer, the 'dozer was preparing a new drilling site and assisting in moving drilling equipment. Both jobs were being done for another drilling contractor on a location near the edge of the pool southwest of Mattoon.

Making a series of lengthwise and crosswise cuts, the 'dozer carved out a level footing for the drilling rig in about an hour's time. The site selected was on a slight incline, making it necessary to make deeper cuts on one side to establish a level surface.

Only 300 feet from this location, the 'dozer had previously graded and dug pits for another location the week before. When the rotary drilling for this well was completed—about the time the TD-14 was ready to start grading the new location—draw works, derrick, substructure timbers, etc., had to be moved to the new spot. Extremely muddy conditions bogged one of the trucks, loaded with the heavy draw works, and the tractor was dispatched to help. With its winch line attached to the truck bumper, the TD-14 pulled the big six-wheeled Diesel Autocar out, then started the rig-site grading.

The pits previously dug were three in number and required about three hours to complete. Dug in the conventional manner, these pits were slightly shallower than those dug by Everett and Brown at Brownsville. The mud or slush pits had lateral dimensions similar to the Brownsville pits but were only about five feet deep.

Trucks on Job

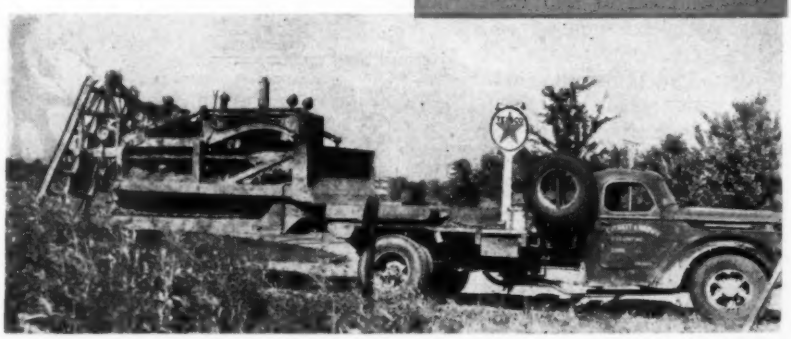
Also on the job—besides the TD-14—were three trucks belonging to the Three Way Company. One was the six-wheeled Diesel Autocar already mentioned. The other two trucks were a six-wheeled 2½-3-ton International and a six-wheeled 2½-ton Reo. Gasoline powered, both were surplus equipment items obtained from the government. Both trucks are equipped with oil field truck body, winch, headache, and truck derrick. They were used primarily for hauling in equipment. The truck derricks came in exceptionally handy for carrying timbers used to form a foundation for the drilling rig.

At present the bulldozer mentioned above is the only such unit owned by Three Way Drilling Co., although they at one time had four—the machines being requisitioned by the government early in the war.

Just up the road from the Three Way job, another bulldozer-equipped TD-14 International diesel tractor was in operation. The 'dozer equipment was Bucyrus-Erie hydraulic. This unit, owned by Winn & Arnett, Mattoon, was working on an oil location that had been finished the day before. All rotary equipment had been

(Continued on page 460)

• Bulldozer rides lowboy, with loading tracks drawn up by means of the winch line.



Florida Phosphate Mining

• Above: Bullgrader clears brush in foreground while Bucyrus-Erie electric dragline with 9-cu. yd. bucket on 143-ft. boom strips area cleared in background. High pressure nozzles on hydraulic guns like the one to the extreme right are used to wash down phosphate-bearing material. Below: Bucyrus-Erie Bullgrader doing preliminary clearing work of knocking down trees which are later pushed into huge piles with brush and burned.

MODERN heavy power equipment plays a most important role in the open pit method used to mine all commercial phosphate in Florida, the leading phosphate-producing state in U. S. Approximately 97% of all phosphate mined in Florida is produced from the land pebble field and the remainder comes from soft rock and hard rock.

The Florida Phosphate Mining Division of Virginia-Carolina Chemical Corp., which owns about 35,000 acres of high-grade phosphate land in Florida, operates on a 2250-acre tract near Bartow, in Polk County where 80% of U. S. phosphate is produced. Virginia-Carolina Chemical Corp. uses an International TD-18 TracTracTor equipped with a Bucyrus-Erie Bullgrader to clear the land prior to stripping operations. The Bullgrader is used to knock down trees and doze them, and brush into piles which are burned.

After the land is cleared draglines are used to strip overburden that averages 20 feet in thickness. The company uses a Bucyrus-Erie electric dragline with an 8-cu. yd. bucket on a 143-ft. boom and a

(Continued on page 460)

Procedures explained for most efficient methods of loading hauling units with power shovels.

By LEE DU BOIS
(Service Engineer, Bucyrus-Erie Co., Seattle, Wash.)

Shovel Loading

MANY PROBLEMS IN LOADING trucks and other hauling units with a power shovel can be solved when operating conditions are ideal, for systems of operation are most easily perfected where they may be tried with the least effort. If the lessons learned and the methods and systems worked out under ideal conditions are carried over onto jobs where conditions are more difficult, it is possible to increase the efficiency of operation and the possibilities of making more profit.

Working under ideal conditions it is possible to arrive at output figures which became a mark to shoot at when confronted with a tough job. Unless is is possible to smooth out the rough spots in battling a tough job under adverse conditions so that the operation may be carried on in much the same manner as on a job where conditions permitted better production records, there may be little or no profit.

Much of the experience gained in pit and quarry work carries over into open cut jobs. Loading and hauling material on cut and fill highway construction may be closely allied to long-haul levee building.

Hauling material is an involved process with many problems. The comments which follow are made to increase production at the loading point and are not considered at a general discussion of hauling problems. The objective is to keep haul units going at maximum safe speed with minimum delays. Separate roads to and from the pit are more desirable than two-way traffic on a single road. The condition of the haul road plays a big part in the quantities hauled per hour. The interval between trucks must be regulated so there are no delays at dumping or loading points. Where separate roads are impossible, long "turn-outs" should be spaced to correspond with the intervals between trucks, so there is no waiting to pass. The planning of haul routes which makes it necessary for trucks to come to a stop at intersections of roads or at passing points must be avoided if possible. Where more than one vehicle is used, strict traffic regulations understood and enforced, promote uninterrupted truck movement.

Placing the Shovel

When a shovel is used for loading material, maximum output depends largely on placing the machine and the hauling units so that the material may be loaded in the shortest possible time. A piece of advice to operators which solves many problems is: "Don't reach for your dirt and don't reach for the haul unit."

The efficient operator always has in mind the importance of keeping the machine as close as possible to the digging face where much material is within easy reach of the dipper. As the work of excavating and loading material progresses, the location of the shovel must be changed to make more material available and the haul units must change their loading point in order to keep the shovel swing as short as possible. To over-emphasize the importance of

the digging position of the shovel or the loading point of the haul unit is to lose sight of the coordination necessary between these two pieces of equipment.

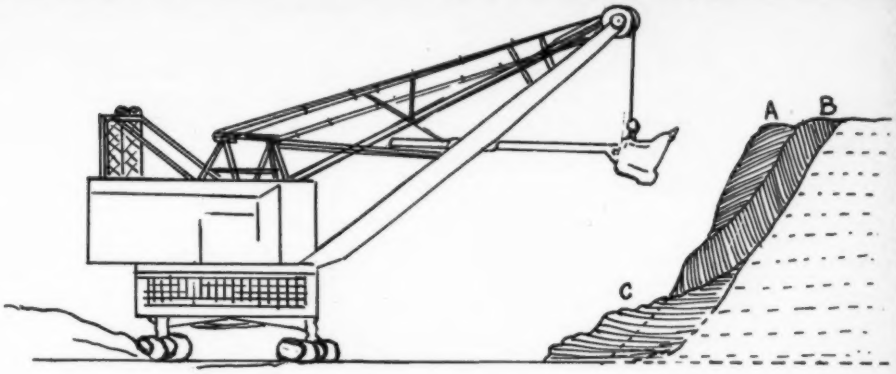
In placing the shovel we have two major choices of procedure. We may make a frontal attack upon the digging face, in which the advance is made by a planned movement of shovel and haul units at a more or less right angle to the digging face. Or, we may operate the haul units more or less parallel to the digging face while the shovel follows the same general direction. Any other method used is bound to be some variation of one of these basic plans.

Parallel Operation

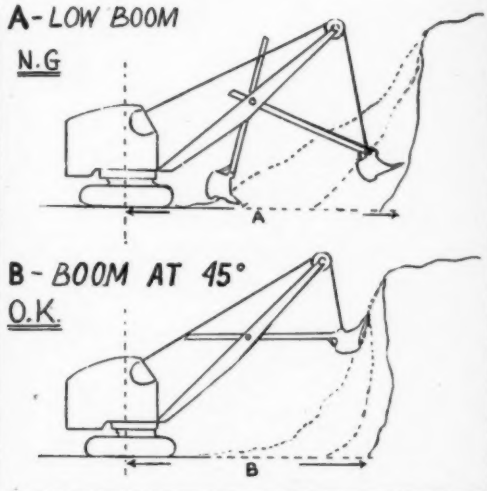
It is a common practice to open a pit with the shovel operating parallel to the digging face. In parallel operation the logical placing of the shovel would be for the inside tracks to travel in a line with the undug face. Pit owners seem to feel that this is not a wide enough cut and so they set the shovel deeper into the cut so that the outside tracks are on the line with the undug face and attempt to move considerable material with a swing which may and does reach 180°. With both tracks inside the area of operation considerable material slides to obstruct the truck road. Keeping the truck road open and loading this material encourages sweeping with the dipper which is very hard on a machine.

Of course material that slides out into the truck road can be taken care of by using a bulldozer in the pit, but many small machine users do not have a bulldozer in the pit.

In addition to these objections there is the ever-present danger to shovels and trucks of slides because they cannot easily escape when operating parallel to the face.



• Above: Where large shovels are used, material in areas A, B, and C may be moved to advantage by short stick operations. Moving close to the bank the shovel removes A with a short stick. A second move closer to the bank moves B with a short stick. It may be necessary to back up the shovel to move the spill portion of C, but while in this last position all the material in C may still be moved with a short stick. Where this procedure can be followed and it is not found necessary to back up to pick up the spill, it is possible to make one clean-up cover two moves ahead.



• There is an erroneous idea in the minds of some operators that yardage may be moved at less cost with the shovel boom at a low angle because they can reach farther with the dipper and consequently the shovel is not moved nearer the work so frequently as when the boom is used at higher angle.

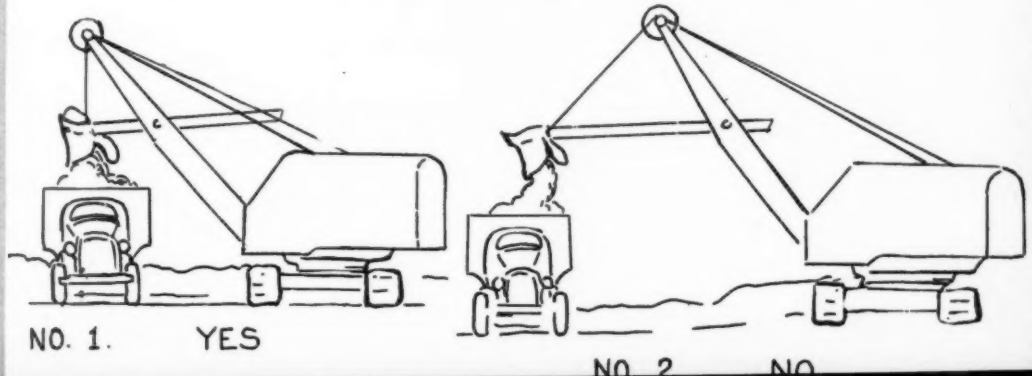
(A) Low boom operation increases power consumption and maximum output produces greater maintenance costs than operating the boom at 45°.
(B) Frequent short moves of the shovel closer to the work while the boom is operated at 45° as much as possible result in minimum cost per yard.

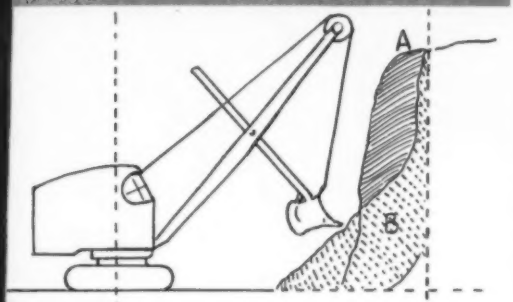
Of course, parallel operation has its place and can be planned so that the work may be carried on very profitably.

The technique used in digging and swinging the material may play some part in a choice of the relative positions of the shovel and the haul units. In order to understand why one method of loading material may be recommended as more efficient than some other, let us take a look at some facts proved by the recordings of electrical instruments.

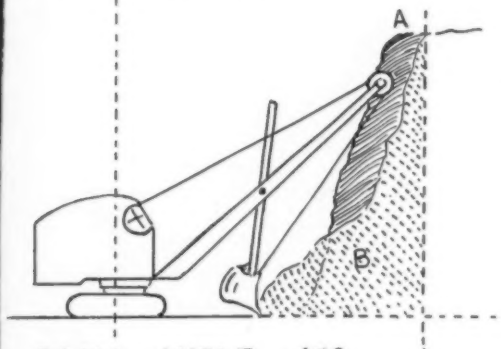
The consumption of power is very accurately measured and recorded by instruments on machines wholly powered by electricity. Comparisons of power con-

• Operational costs on both shovel and truck will be higher when loading is done with extended dipper as in figure No. 2 than when truck is loaded under boom point as in figure No. 1.





BOOM ANGLE 50°



BOOM ANGLE 40°

• Changing the angle of the boom of a small shovel used to require some time and so the angle of the boom was seldom changed. On modern small shovels the change may be made with no loss of time. If this improvement in machine design is not utilized an opportunity of increasing production is neglected.

By moving the machine closer to the bank and taking out the material in area A with the boom at a high angle, we use short sticks and an economical position of swinging the dipper. By lowering the boom slightly we take out the material in area B with short sticks, where the digging may be tough.

sumed are a very good yard stick for the measurement of the economy and the efficiency of a method of operation. Ordinarily no instruments of such nature are standard equipment on machines powered by internal combustion engines. However, the general construction of an electric shovel is sufficiently like one powered by an engine, and the work done by the two machines is so similar, that some of the lessons learned from the instruments on an electric shovel may be applied to problems confronting a shovel powered by an internal combustion engine.

There is a direct relationship between power consumption and maintenance costs. The cost of maintenance may be expected to be heavy where power consumption is high. Recording instruments show that more power is consumed in swinging a shovel with dipper sticks fully extended than is used when the swing takes place with dipper retracted. The same is true when the dipper is loaded far out or close in. Since power consumed may be an indication of the extent of wear and tear on all parts of the machine, it would be wise to choose a method of operation which favors a minimum of power consumption rather than one which requires the maximum.

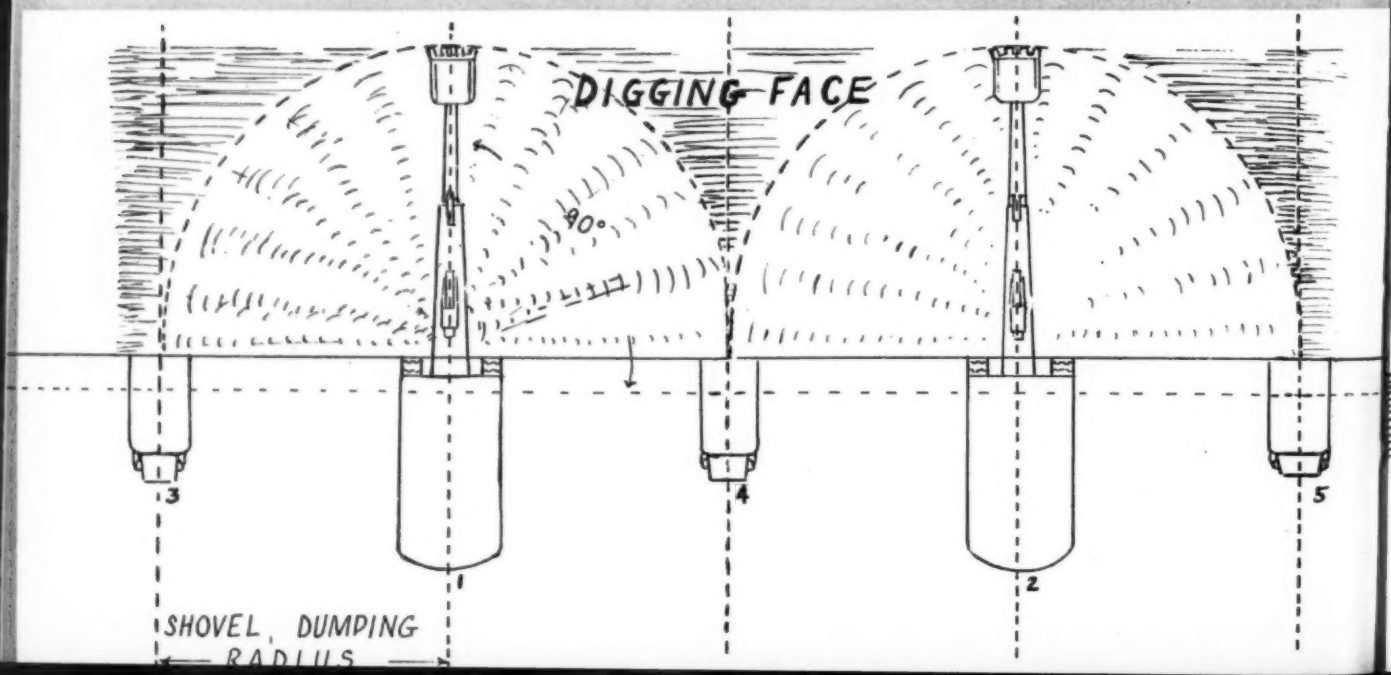
Theoretically, it might be possible to paint a scale on the side of a dipper stick with the figure I at the lower end near the dipper and 100 at the upper end near the green-horn to call attention to the fact that the length of stick used has a bearing on production cost, all of which means that we should plan to load the dipper under the point of the boom and avoid loading the dipper out beyond the boom point as much as possible.

A shrewd operator digs only so far in front of the boom point as will give ample swing clearance for the dipper. Observation of his technique will prove he seldom needs to retract the dipper after it is loaded. Less effort is required to hold the loaded dipper with the brakes when the dipper is vertically under the boom point than is required when the sticks are extended or retracted. If a major part of the work done by the dip-

• In laying out a pit some operators establish parallel lines, real or imaginary, spaced at a distance equal to the dumping radius of the shovel.

The shovel is placed on a line and trucks are loaded on the line on either side of the shovel. When the arc of shovel swing reaches 90° angle, the shovel is moved over to the next line beyond truck loading point and loading continues until 90° angle is again reached and the shovel is again moved. This continues across the digging face of the pit. On the following trip across the face, the shovel operates from the positions formerly occupied by the trucks.

Advantages of the right angle method of operation are that the shovel always operates on a maximum 90° angle swing and trucks and shovel can easily avoid slides.



per can be accomplished in the area under the boom point, maintenance is reduced to a point near the minimum. As registered by the amount of power consumed, the advantage of operating the dipper in a close area may be as high as 18% over-operation in a larger area where the sticks may be frequently extended.

Under average operating conditions, 60% of shovel cycle time is occupied by swinging the dipper from loading point to dumping point and returning the dipper to the digging face. By close attention to planning the position of the shovel with relation to the material to be loaded and the loading point of the haul unit, this figure may be considerably reduced.

Double Spotting

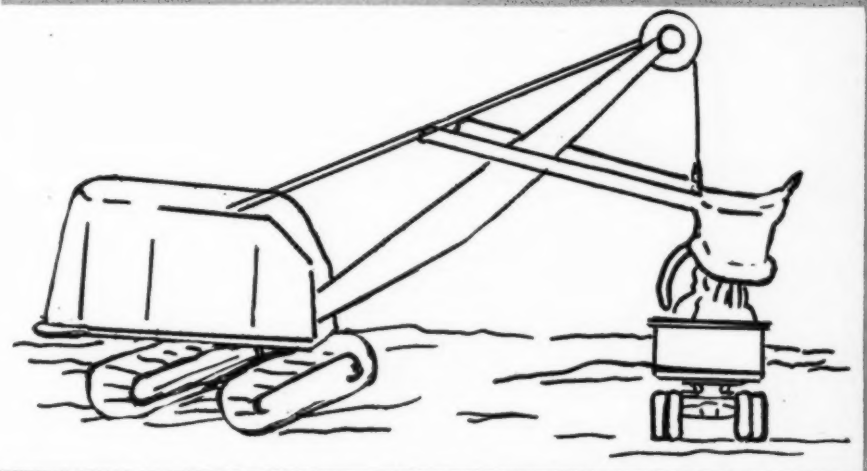
When the operation consists of a right angle attack upon the digging face, the efficiency of backing a haul unit into loading position on each side of the shovel has been proved. Shovel and haul units are in the best position to move away from the face in case of a slide. Loading may be done with a short angle of dipper swing. No time is lost in spotting trucks. There is no necessity to swing the dipper near the cab.

On some phases of the work it may be necessary to swing some material 180 degrees between digging point and loading point. By careful planning of the order of material movement, it may be possible to reduce the length of swing on a large percentage of the total quantity.

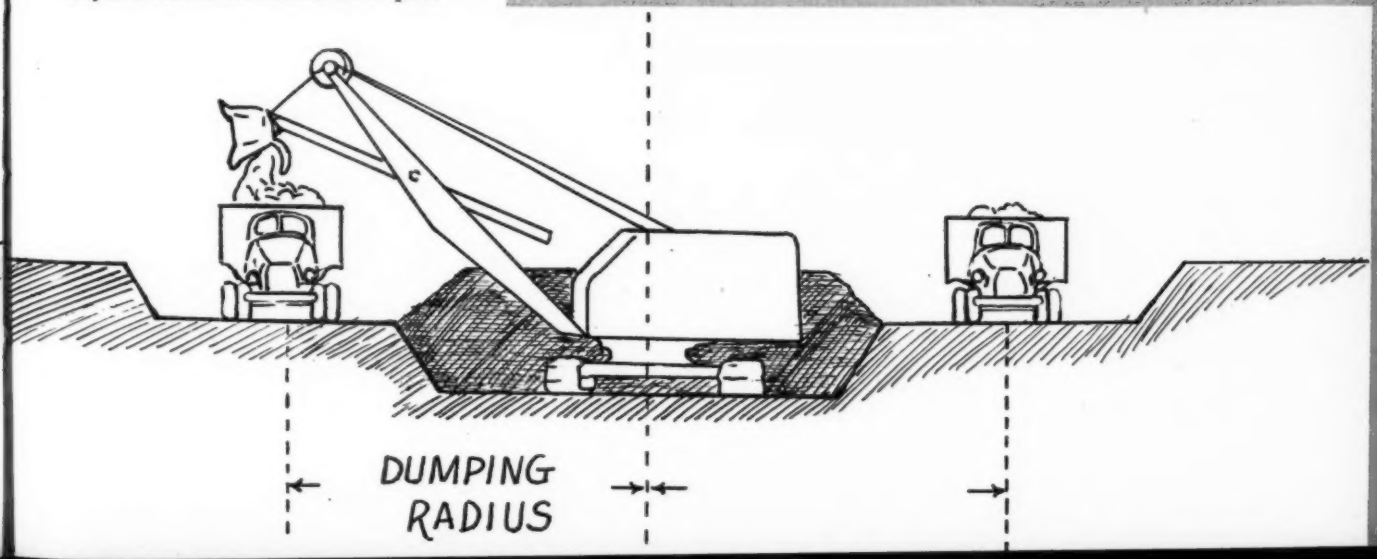
The wise operator sets some limit of swing angle in his mind beyond which he considers it poor policy to load the haul units. When this limit is approached, he changes the position of the shovel or the haul units so that the swing angle may be reduced. If 90 de-

(Continued on page 460)

• Equipment must be co-ordinated. Above: Small shovels operate at a disadvantage when loading into a large high truck. Below: Time is lost spotting a large dipper over a small truck.



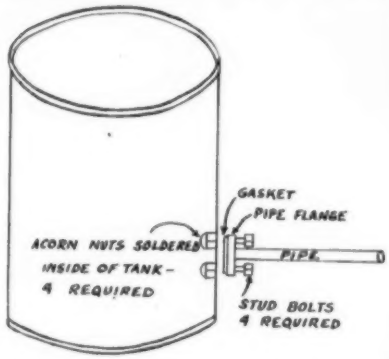
• Below: When the nature of the work makes it necessary to dig and load from the pit floor, the dumping radius of the shovel must be taken into consideration when planning the pit and depth of cut regulated to avoid a high hoist whenever possible.



Field NOTES

Inside Tank Connections

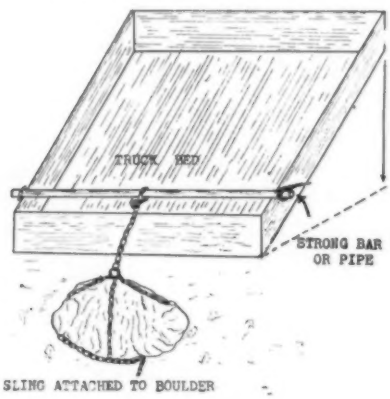
When moving storage tanks there is always a chance of bending or jamming replacements. This can be eliminated by having your connections made inside the tank, through the use of soldered



acorn bolts. First, drill the flange and place flange in position on the side of the tank. Then mark the hole positions and drill them into the tank. Next line up the flange holes with the tank holes and run stud bolts through into the inside of the tank. After placing acorn nuts on the bolts from the inside, tighten them fast and solder the nuts. This will leave you with an inside connection relatively free from harm.

Removing Boulders

When faced with the problem of removing a large boulder and there is no large equipment on hand, the ordinary dump truck can do the job in a snappy manner with this little time-saver. Attach



• Los Angeles building contractor Rodney Walker finds that his postwar Willys Jeep with special equipment serves as a bulldozer and when in reverse gear as a scraper. Because of the angles, grades and pitches of the rough terrain upon which he is building his house he found that the Jeep was superior to the conventional bulldozer. He rigged up framing to handle the large blade and the scarifying teeth.

a strong bar or pipe to the truck bed crosswise (chains can be used) and then elevate the truck bed. Using a wire or chain sling, secure the boulder firmly and fasten the other end of the sling to the iron bar. By simply lowering the truck bed, the boulder is easily lifted off the ground and may be hauled away.

Pipe-stringing Tool

Here's a tip for contractors who find it necessary to lay long strings of pipe in their work. Many experienced field foremen have noted that four men, working together, can carry and distribute a third more pipe in faster time and with less fatigue than four men working in pairs. The tool enabling four men to work in cooperation can be quickly made by any welder. Two four-foot lengths of 1-¾" pipe can be used for the handles. On each handle, three pieces of boiler flue, six inches in length, are welded equidistant from each other in the center of the handle. All that is necessary to go into action is to man the handles and insert the pipe sections through the boiler flues. Care should be taken when doing this not to damage the threads of the pipe.

Elevating Roof

An inexpensive covering protector for emergency supplies of cement, or other materials that suffer from harmful effects of weather which a contractor likes to keep on hand ready for instant use, is an elevating roof. The roof can be constructed from rafters of 1x3-inch material bolted together and strips of composition roofing placed over the joints. Supports for the roof are two 18-foot poles set at each end for the raising and lowering of the roof by the use of ropes and a pulley attached to the top end of each pole. Guide bands around the poles at the bottom of the roof keep it from swinging in the wind. In case a shower should come up while the emergency material is being used, strips of canvas are kept handy to hang around the sides of the roof.

Truck Stake Lock

A simple arrangement can be made to keep truck stakes from jarring out of their sockets. Using a wood chisel, cut in stake recess tapered from point of spring to the bottom of the stake. Turn a lip on end of a piece of spring steel and rivet the spring to the stake.

To insert stake all that is necessary is to push the spring back into the stake, insert stake in the socket, and push down into place. Spring will open out and lip will engage bottom edge of socket and hold stake in place. To remove stake—push in on spring and pull stake out.

William P. Houser.

Precisionbilt TO REDUCE DOWN-TIME

J&L WIRE ROPE

PERMASET PRE-FORMED

When you are fighting for every yard of fill you can get you want to reduce down-time on your shovels to a minimum and keep those big trucks rolling until you hit pay dirt. The next time you replace a shovel rope—use J&L Precisionbilt Wire Rope. It is made of J&L Controlled Quality steel to give you longer service and help you cut down on costly delays. Our wire rope engineers will be glad to go over your equipment with you—check it for good rope practice. Write today.

J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION

GILMORE WIRE ROPE DIVISION

PITTSBURGH 30, PENNSYLVANIA

J&L *Precisionbilt* PERMASET PRE-FORMED WIRE ROPE

Equipment you ought to KNOW ABOUT

For further details about the equipment on these pages please write to the manufacturer, mentioning Excavating Engineer.

Dumpcrete

Manufacturer: Maxon Construction Co., Inc., Dayton 2, Ohio.

Claims: The Dumpcrete, a new construction tool for transporting air-entrained concrete from a central mixing plant to the job site, is built of all-welded high tensile steel with important weight-saving features. Developed as a direct result of the company's success in hauling air-entrained concrete over distances that were formerly considered advisable only with continuous agitation of the mixture, the machine has a novel design permitting discharge of concrete as high as 6'3" from ground level.

A specially designed and arranged hydraulic hoisting mechanism provides a dumping angle of 90 degrees that combines with the rounded corners of weld-grounded smooth interior to make possible a clean and fast discharge. An adjustable baffle, deflector plates, and an inverted center keel produces a discharge similar to that of a bottom-dump bucket.

The Dumpcrete is being produced in two models, 2C and 4C, with respective rated concrete capacities of 2 and 4 cu. yds.

Wayne Crane

Manufacturer: American Steel Dredge Company, Inc., Fort Wayne, Ind.

Claims: A completely new rubber-mounted, mobile crane unit, embodying power shovel, trench hoe, dragline and clamshell that was satisfactorily pilot-tested for two years of regular service in the material and erection yards of a steel fabricating plant and used by general contractors for trenching, basement excavations, drainage ditching and cleaning, and for handling sand and gravel.

The crane and attachments, which were designed by John D. Rauch, possess the following features: independent or simultaneous operation of boom, shovel or trench hoe, or propulsion mechanism; ability to travel, boom, swing and hoist at the same time; a self-leveling chassis which permits operation on uneven ground; full-vision cab that revolves on a 48-inch ball-race outside the swing-gear; and enclosed, oil-immersed machinery gears.

Wagon Drill

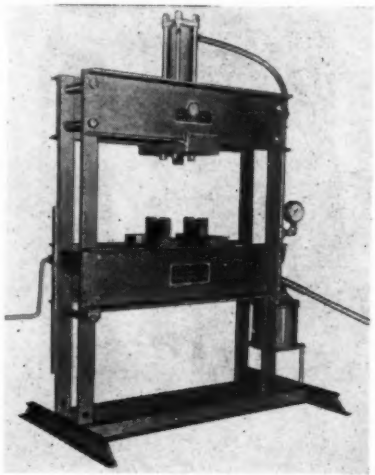
Manufacturer: Worthington Pump and Mach. Corp., Harrison, N. J.

Claims: The UMW-40 uses a heavy duty drifter, the cylinder of which has a diameter of four inches, and it has rifle bar rotation and positive acting end-seating valve with circumferential seal. The cylinder controlled blowing device gives exceptional hole cleaning ability. Heat treated alloy steel is used in all major parts, and slow rotation parts are available. The drifter may be easily converted to wet drilling.

60-Ton Shop Press

Manufacturer: Rodgers Hydraulic, Inc., Minneapolis 16, Minn.

Claims: Features of the press, called the Rodgers "Sixty," are fast operation, ruggedness, versatility, and large capacity for work size. Power is supplied by a Rodgers 2-speed hydraulic hand pump which, in high speed, moves the ram 2½ feet per pump stroke, giving up to 2,000 pounds pressure in fast travel. The lever on the pump may be quickly flipped for high pressure operation.



The hydraulic cylinder rests on rollers which ride the flanges of the upper bolster, and may be moved across the entire working width of the press when desired. Ram travel is full 13 feet at a continuous stroke, due to the long cylinder.

Flexibility of the press is achieved through adjusting the lower bolster by means of a hand crank. Maximum opening between bolsters is 38 feet, minimum is eight feet. A special model with an opening range from eight to 48 feet is available. Although working width between the sides is a generous 45 feet, long pieces may be handled through the open sides any place above the globe valve and pump.

Dual Batching Plant

Manufacturer: The C. S. Johnson Co., Champaign, Ill.

Claims: A new development for road builders provides for dual batching of aggregates. The aggregate bin is of the portable section type, of 100 cu. yd. capacity, divided into three compartments, with hinged log sections for fast erection and moving.

Two multiple material batchers of 34E paver-batch capacity are

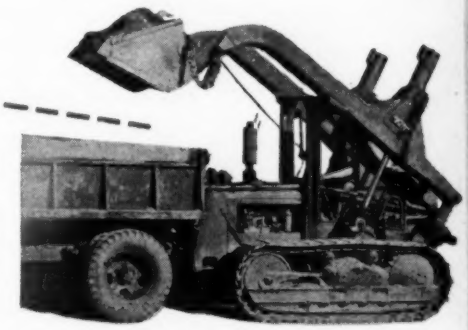
always busy because

IT DOES SO MUCH SO WELL

A Bucyrus-Erie DOZER-SHOVEL handles so many digging and materials handling jobs so swiftly and at such low cost that you'll find it's constantly on the job earning money for you!

Quickly convertible

The shovel is easily converted into a bulldozer by interchanging the bulldozer blade with the shovel bucket, a conversion requiring a short time in the field. For crane service you simply swing over the hook on the bucket or blade. The shovel can be used for heavy excavation and bulk material handling, the bulldozer for cleanup work etc., the crane for lift-about service, almost without interruption.



SHOVEL

As SHOVEL you'll like the way the unit gets full capacity loads in a hurry . . . the way the strong lift arms take heavy materials and reach over a truck or pile for loading or piling with minimum spillage. You'll like the fast filling, specially designed bucket that discharges quickly by gravity at a simple pull of the trip lever.

As YARD CRANE, for general lift-about work of single objects — engines, rails, pipes, etc. — you'll like the convenient crane service (with either shovel or bulldozer) that features high lift to clear gondola car tops, the ability to "turn on a dime" for working in close quarters.

YARD CRANE

BULLDOZER

As BULLDOZER you'll like the way the blade grades a slope and kicks the load off the blade at the end of the push by utilizing the trip mechanism that dumps the bucket. You'll like the way the bulldozer uses down pressure for fast, hard digging on road maintenance, overburden stripping, airport and highway construction, backfilling, grading etc.

Ask your International TracTracTor Distributor about the DOZER-SHOVEL's many other features too: maintenance of original tractor balance, full front visibility, low overhead clearance, positive down pressure, simple strong design, oscillating tracks.

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

381

See your INTERNATIONAL TRACTRACTOR DISTRIBUTOR

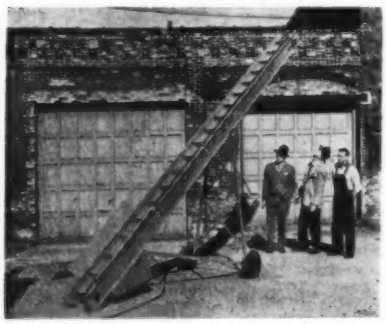
so located that a single operator can handle both batchers. The batchers are discharged simultaneously into the separate compartments of two-batch trucks, thus requiring only one spot at the aggregate plant, and effecting a saving in batching cost through reduced man-power and time at the batching plant. A reduction in hauling units is also possible on most jobs, due to the saving in standing time at the plant.

To further increase batching efficiency, dual cement batchers are provided for in Johnson Bulk Cement Plants, including the Dutch Mill, the Portable Section, and Twin Silo units. The Twin Silo has also been recently developed to provide storage capacity up to 1610 barrels of cement, and is the largest portable unit in the Johnson line.

Highboy

Manufacturer: American Conveyor Company, Chicago.

Claims: An improvement in the



line of portable electric conveyors, the High-Boy can raise the conveyors over 12 feet, unload and load materials from box car to bin or loading platform, stack many kinds of bulk and package material.

Built to fit any machine in the American Conveyor line, the High-Boy is simple to attach and detach; has "T" iron frame, safety stop, sprocket and roller chain winch, pneumatic tires, and roller bearings.

FWD Truck Model HG

Manufacturer: The Four Wheel Drive Auto Co., Clintonville, Wis.

Claims: A four-ton capacity truck, the HG is designed to mount such optional equipment as body, hoist and underbody blade for general highway maintenance, and snow plow fittings for winter work. Especially adapted to road maintenance work, the truck is engineered to grade roads at five to 15 miles per hour, and maintain roads up to 20 m.p.h.

The HG has a clearance of 22½ to 24-13/32 inches, depending on tire size. It grades roads and shoulders, cleans ditches, hauls men and material, pulls graders and scarifiers, transports heavy equipment, plows snow and by actual count performs over 50 other road maintenance jobs.

Drill Steel Guide

Manufacturer: Universal Pneumatic Tool Co., St. Louis 1, Mo.

Claims: The Maloney Drill Steel Guide is a tripod arrangement with an extension on one leg for securing the device—either by foot pressure or chain. The Guide eliminates the necessity of having one man steady the drill and run the risk of injury while another is swinging the sledge. Fifteen feet of flexible chain is furnished with each guide for wrapping around boulders and holding the guide in place while drilling is being done.

The Maloney Drill Steel Ejector is a practical device designed to loosen drill steel that becomes stuck in holes. Constructed simply on the lever-fulcrum basis, one end of the ejector is fashioned to be attached to the "stuck" steel while pressure is exerted on the other end to loosen the steel. The pressure end is made to shank form to fit pneumatic drills which are used to apply the loosening force.

Drott Hi-Lift Loader

Manufacturer: Drott Manufacturing Corporation, Milwaukee 9, Wis.

Claims: The Drott Hi-Lift Loader is a new front-end tractor loader, with extremely high lift and reach, and is designed for mounting on Oliver Cletrac crawler tractors. According to the manufacturers, the machine has been in use for over a year and has cut loading cost of material handling on various operations—from digging basements and loading loose materials, to stripping coal mines and excavating hard clay.

Possessing a high lift of approximately 10′8″ and a standard bucket of 1¼ cu. yds. capacity, the machine dumps its load about five feet ahead of the radiator—a definite advantage for loading trucks and other vehicles. A light material-handling shovel of 1¾ cu. yds. is available for handling coal and other light materials. Hydraulically operated, the unit is equipped with front-mounted pump.

Tu-Control Crane

Manufacturer: The Browning Crane & Shovel Co., Cleveland 10, Ohio.

Claims: This new rubber-mounted, two motor crane is designed to permit immediate transfer of traveling and steering functions from the driver's cab to crane operator's cab. The crane is operated from the driver's cab at truck speed when traveling overland or through congested areas. Upon arrival at the job where the crane operator requires full control over his machine, the truck functions are taken over by him through the "Tu-Control" mechanism.

On the job, the truck is moved forward, back, and turned by the crane operator with the truck motor shut off. Precise control over the truck in relation to the load on the boom is assured. Where needed, the travel and steer controls can be transferred back to the driver's cab almost instantly.

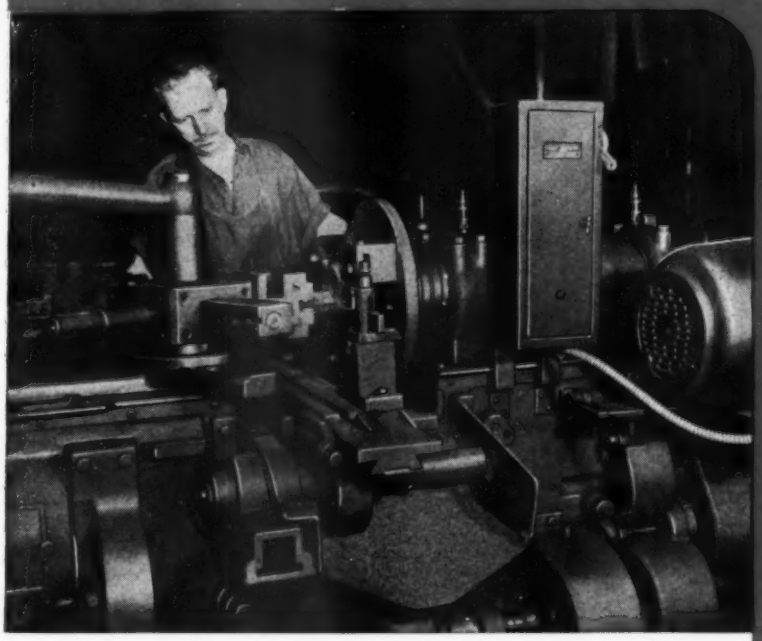
New Tandem Rollers

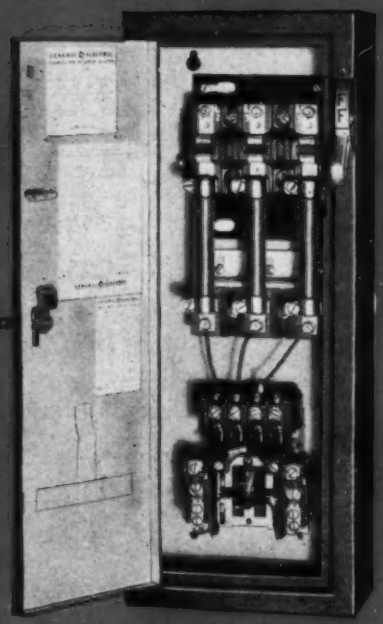
Manufacturer: Buffalo-Springfield Roller Co., Springfield, Ohio.

Claims: A complete new line of streamlined tandem rollers incorporating new mechanical improvements are being produced in sizes of 5-8 tons, 6-9 tons, 8-12 tons and 10-14 tons that can be powered by either gasoline or diesel engines. Supplementing the new 10 and 12-ton 3-wheel rollers and 3-4 ton tandem previously announced this year, the new line possesses many of the basic principles of previous Buffalo-Springfield tandems, and in addition has a simplified 4-speed forward and reverse transmission to provide a properly stepped speed range for all types of operating and conditions.

Other features include increased operator vision, greatly

300 G-E COMBINATION MOTOR STARTERS...





...give White Motor Company real protection...save time, money, too.

Magnetic starter and motor-circuit switch in *one* unit—G-E "combination" motor starters of this type give co-ordinated control to over 300 machines in the White Motor Company plant in Cleveland.

The starter shown above is installed on a lathe used in making water pumps. Others control drill presses, shapers, boring mills, grinders, and many other types of machines.

Here's Why the Combination Starter Was Chosen

- Fast-acting overload relays protect the motor controlled from overheating—and fuses protect it from damaging short circuits.
- Safety for operators is assured by interlocking doors. While the power is on, the door cannot be opened.
- Quick servicing and availability of repair parts is made possible by G.E.'s broad network of sales outlets.

Wide Field of Application

This motor company represents just one of the many different industries in which G-E combination starters are at work today. Why not give the advantages of these compact, time-saving starters to *your* plant. Our engineers will be glad to help with your application. Get in touch with our local office today. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

HOW YOU SAVE...

. . . TIME. Instead of buying two devices, you order and install only one. Mounting time is cut as much as 40 per cent.

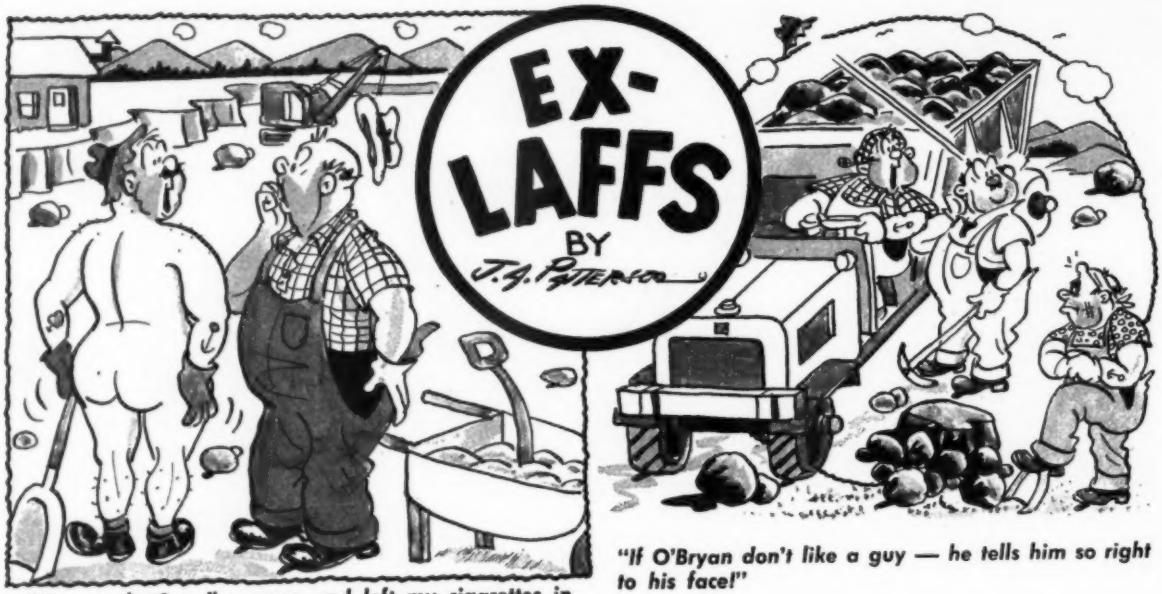
. . . SPACE. Compact combination starters can be mounted in small unused places near to or remote from the operator.

. . . MONEY. The list price is slightly more than for two separate devices, but the difference is more than made up by savings in wire, conduit, and fittings.

MORE INFORMATION about combination starters is given in our Bulletin GEA-3715A. Ask our local office for your copy.

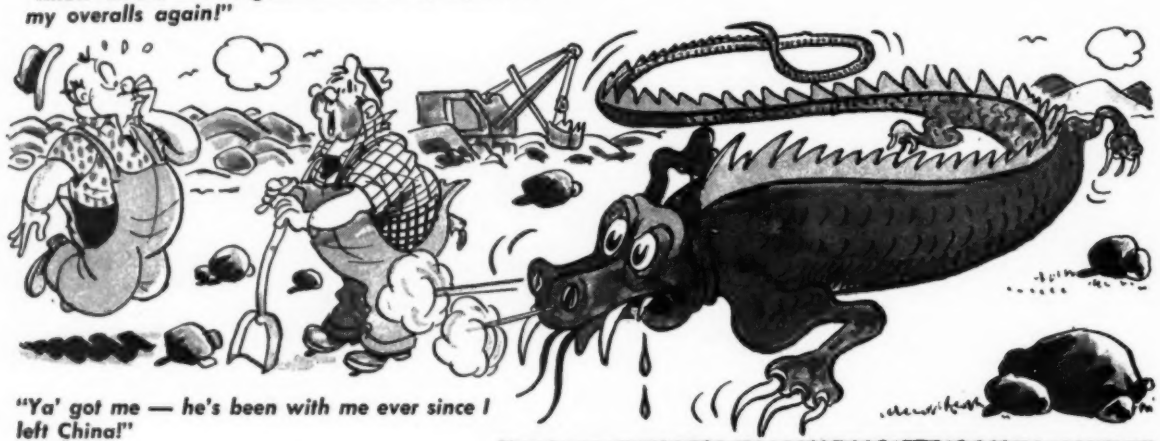
GENERAL ELECTRIC

676-200-8910



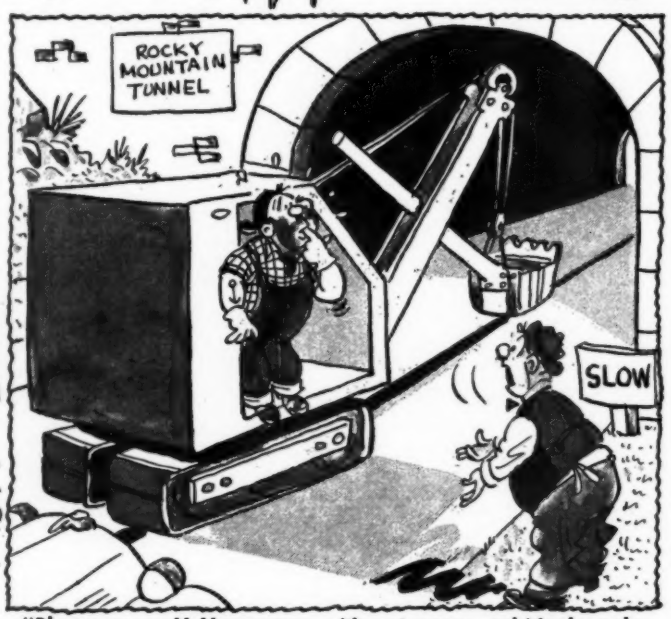
"Know what? — I've gone and left my cigarettes in my overalls again!"

"If O'Bryan don't like a guy — he tells him so right to his face!"



"Ya' got me — he's been with me ever since I left China!"

"You heard me Mulhall — Get rid of the stripes on that old army jacket or we'll get rid of you."



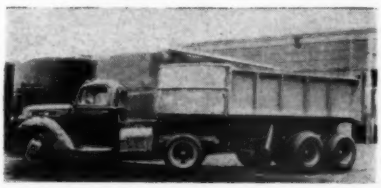
"Please go on McNammara — it's not scarry and it's the only way to reach our work on the other side!"

improved engine and transmission controls, a refined hydraulic pump and hydraulic steering circuit, and a further advanced bevel gear and pinion final drive.

Dump Trailer

Manufacturer: Freuhauf Trailer Co., Detroit, Mich.

Claims: The new trailer of 19 cu. yd. capacity is especially designed for coal delivery, but can be used equally well for hauling sand, gravel and other materials.

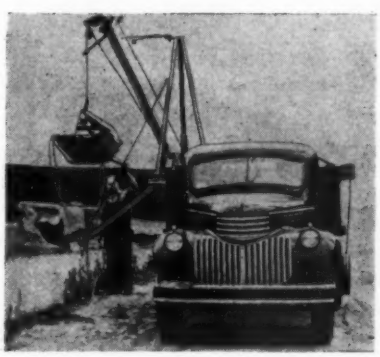


Body dimensions are 18′ x 7′5″ x 47½″. Also available are models with 8-1/3 and 15½ cu. yd. capacity.

Truck Loading Device

Manufacturer: Cascade Manufacturing Co., Portland 10, Oregon

Claims: The Cascade Scraper is an unusual new development in truck loading devices and is a maintenance tool requiring no power plant or power take-off from the truck motor. One man operates the 1/6-cu. yd. scraper in the ditch while the driver remains in the truck.

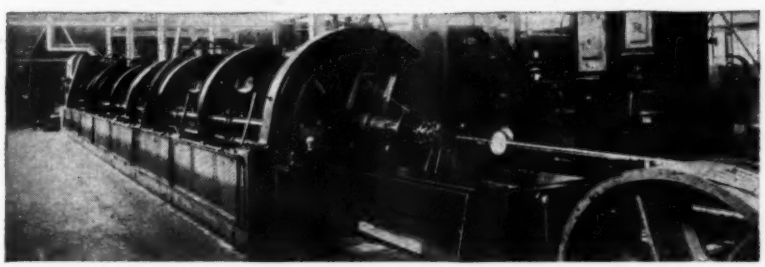


The scraper is adaptable to any standard dump truck. In working with the scraper, the boom is swung out over the ditch and the scraper is pulled along the ditch by means of a cable attached to a drawbar as the truck moves forward. After the scraper is filled, the truck backs up and a winding drum attached to the rear wheel supplies power for raising the scraper and swinging it over the truck body.

FROM THE MAKING OF THE STEEL—

THROUGH PROCESSING THE WIRE—

TO FABRICATING THE WIRE ROPE—



WICKWIRE SPENCER WIRE ROPE

is safeguarded by continued, careful control to assure the utmost in performance, safety and long life. Wickwire Spencer Wire Rope is available in all sizes and constructions—both regular lay and WISSCOLAY *Pre*formed.

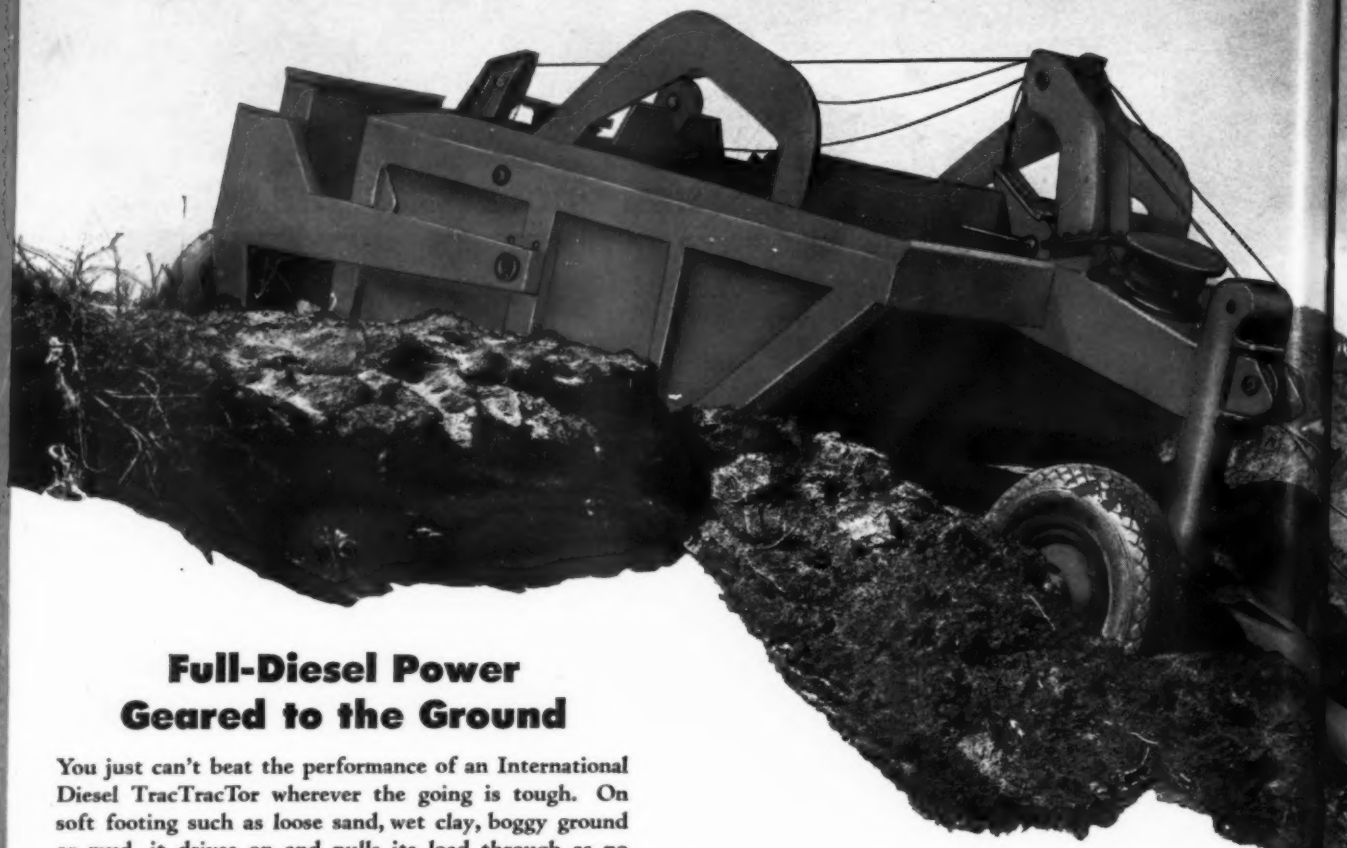
HOW TO PROLONG ROPE LIFE AND LESSEN ROPE COSTS...

Thousands of wire rope users—old hands and new—have found "Know Your Ropes" of inestimable value in lengthening life of wire rope. Contains 78 "right and wrong" illustrations, 41 wire rope life savers, 20 diagrams, tables, graphs and charts. For your FREE copy, write

Wire Rope General Sales Office, Palmer, Mass.

WICKWIRE SPENCER STEEL DIVISION
The Colorado Fuel and Iron Corporation
THE CALIFORNIA WIRE CLOTH CORPORATION

INTERNATIONAL



Full-Diesel Power Geared to the Ground

You just can't beat the performance of an International Diesel TracTracTor wherever the going is tough. On soft footing such as loose sand, wet clay, boggy ground or mud, it drives on and pulls its load through as no other type of tractor can do. This ability to take hold and convert power into pull, regardless of footing, yields profits. More work is packed into each hour otherwise wasted in idleness or expensive maneuvering.

Beyond this immediate benefit is the long-range money-satisfaction of International's unbeatable operating economy. For example, the advanced-design fuel injection and combustion system of International Diesels extract the last ounce of power from fuel consumed. This keeps fuel costs down to bedrock, assures longer life for the engine. Sturdy construction and matchless service accessibility of every part of the tractor reduce maintenance to the minimum, avoid unnecessary and expensive down time.

Add to these the many other superior features of International TracTracTor design and operation—which the nearest International Industrial Power Distributor is prepared to explain and demonstrate. You'll agree that, for the tough jobs in earth-moving, construction, lifting, carrying and excavating, International Diesel Crawlers are unbeatable. They provide the kind of traction that takes hold, that assures maximum power at drawbar or 'dozer blade under every conceivable working condition.

You'll be ahead, with this combination: International Diesel TracTracTors and the matched equipment available through International Industrial Power Distributors. Yes, you'll be ahead in many ways—in lower-cost power, in time-saving performance with equipment tailored to your operations. That's why it will pay to standardize on International Tractors, Power Units and International-powered equipment. Look into the profit possibilities of their use on the jobs you're planning, now.

Industrial Power Division

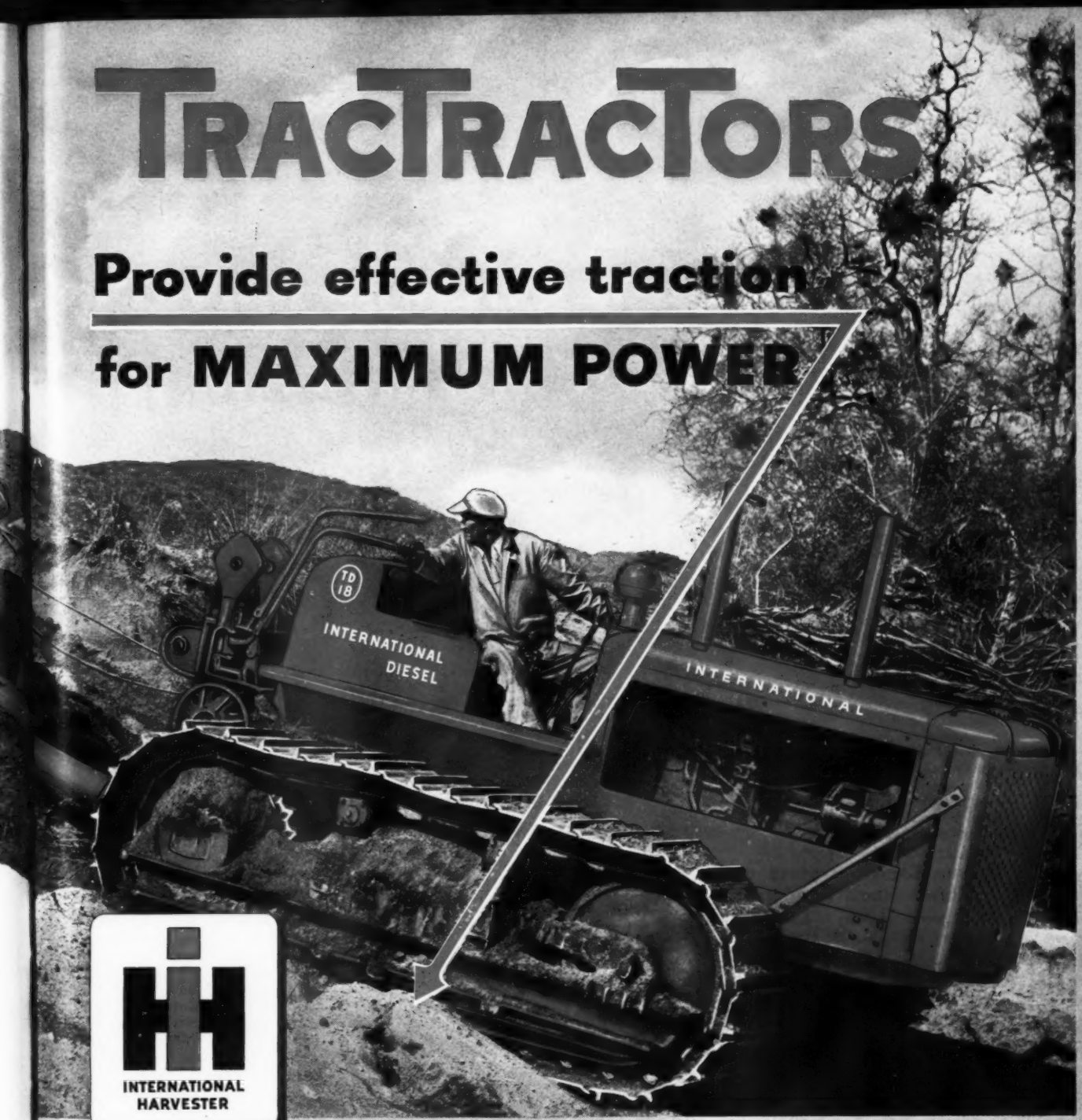
INTERNATIONAL HARVESTER COMPANY

180 North Michigan Avenue **Chicago 1, Illinois**

Listen to "Harvest of Stars" Every Sunday, 2 p. m., E. S. T.! NBC Network

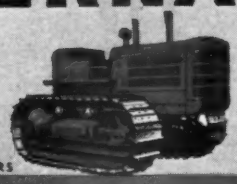
TracTracTors

Provide effective traction for MAXIMUM POWER



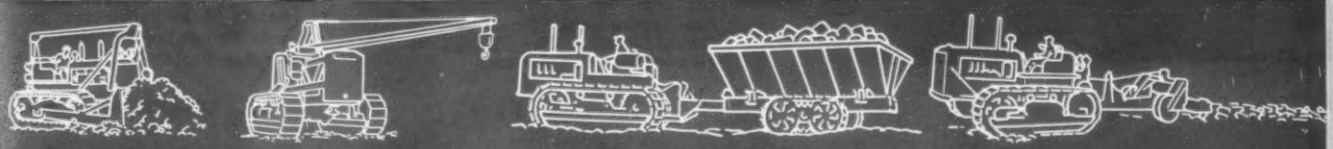
INTERNATIONAL HARVESTER

INTERNATIONAL *Industrial Power*


TracTracTors

Power Units

Wheel Tractors



Shots from the FIRING LINE

Total New Construction Doubled Since January

Total new construction, valued at $921,000,000 in June, has about doubled since the first month of the year, the Construction Division, Department of Commerce, announced.

However, the monthly rate of increase has tapered off. This is because the volume is getting so high that further large gains are unlikely as long as construction materials are in short supply, the Construction Division pointed out.

Moreover, the effects of restrictions on nonresidential building imposed by the Civilian Production Administration are now beginning to be felt.

Privately financed residential construction (excluding farm buildings, trailers, and conversions) was valued at $324,000,000 in June, eight percent more than in May and nearly 600 percent more than in June 1945.

Privately financed nonresidential building was valued at $315,000,000, nearly nine percent over May volume and about 320 percent above that in June 1945.

The value of all privately financed construction in June was $752,000,000 —nine percent more than the May dollar volume and 274 percent more than the June 1945 volume.

Total publicly financed construction was valued at $169,000,000 in June. This was a 22-percent increase over the May figure, but a 19-percent decrease from June 1945 volume.

Name Long Secretary of Florida Road Builders

Appointment of John A. Long as executive secretary of the Florida Road Builders Association, with headquarters in Tallahassee, was announced by Alexander Brest, president of the group.

With a background of 32 years' experience in all phases of highway planning, design, construction and administration, Long has been a staff official of the American Road Builders Association in Washington, D. C., for the last seven years. From 1924 to 1939 he served in Florida as county engineer for Duval and Lee counties, and as a project engineer in the bridge division of the Florida State Road Department. He is a member of the Florida Engineering Society, and a past president of the Florida section of the American Society of Civil Engineers. He is a veteran of both world wars, and recently was cited for his technical and executive services in the Production Division, Headquarters Army Service Forces.

• **France, Germany and Switzerland border near Basle, Switzerland. This three country corner, which is really in the middle of the Rhine River, is identified by this nearby sign, "Three Country Corner Pylon." The dredge is cleaning the river bottom.**

Over $350,000,000 Slated For New Mexico Projects

More than $350,000,000 worth of capital improvement projects are slated for contruction in New Mexico, it was estimated by the New Mexico State Planning Board.

Figures compiled by the board showed that projects under construction, ready for contract, in preliminary stages or contemplated totaled $354,294,000, of which $100,278,000 was for projects ready for contract or under construction, another $249,753,000 in preparation and $4,263,000 in preliminary stages. Projects making up the $100,278,000 figure included $41,507,000 already under construction.

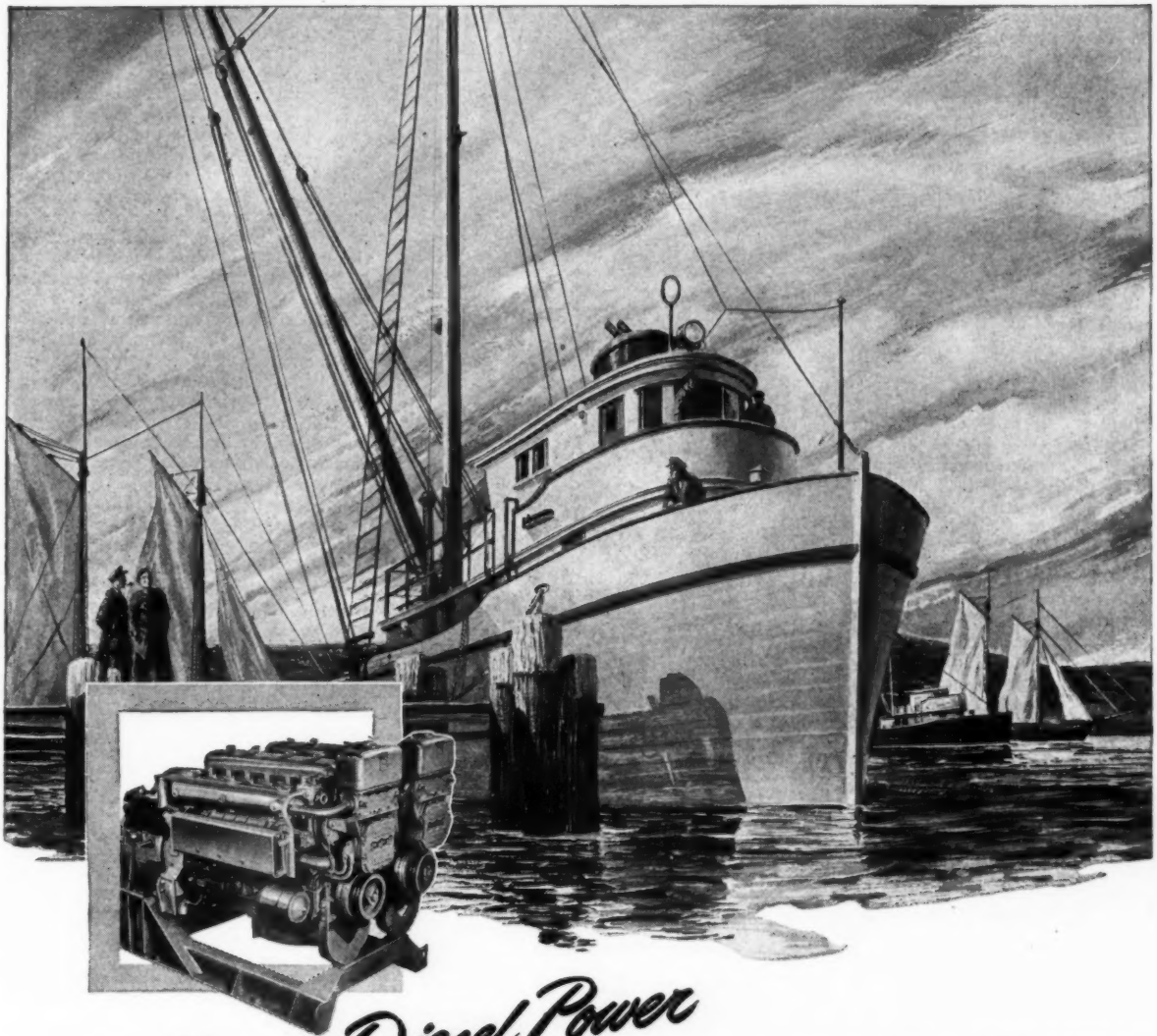
• **Fill for Anderson Ranch Dam, Idaho, being loaded to Euclid truck by Bucyrus-Erie 5-cu. yd. shovel.**

Planning Board Director Vincent J. Jaeger explained that $16,000,000 is listed for highway projects but that only approximately $7,000,000 in such contracts had been let by June 1. Another $12,000,000 was listed for the Arch Hurley Irrigation District, but only about $2,000,000 was scheduled for completion this year. Another $4,000,000 is scheduled for a statewide rural electrification program, with not more than $500,000 to be spent this year.

The more than $350,000,000 total includes $232,341,000 in projects from federal funds, $68,505,000 from state funds with federal aid, $24,477,000 in state, county, municipal and school district funds and $28,971,000 in private construction with no state or federal funds involved.

Nine Northwest Projects to Benefit from Appropriation

An all-out assault on arid and semi-arid wasteland in the Pacific Northwest was in prospect as the result of the signing of the 1947 Interior appropriations bill by President Truman. The bill includes nearly $29,000,000 for construction of Federal irrigation and multiple-purpose projects in this area,



For Great Diesel Power —set your course by the fisherman

FISHERMEN make their money by getting back fast with the most fish and at the least cost. There's no profit in hauling around big, heavy engines that take up a lot of room.

So every day sees more and more General Motors Diesels going into fishing boats. And for good sound reasons.

These Diesels pack more power in less space—weigh less than older types. *So GM-powered boats carry more fish.*

GM Diesels get efficient combustion from low-cost fuel—keep going day after day with the least maintenance.

Add these features to the reduced fire hazard, easy starting, quick availability of parts and service, and you see that GM Diesels have features that are valuable everywhere power is needed. That is why they're taking over so many jobs that Diesels never handled before.

Whatever needs for power you may have in road-making machinery, cranes, shovels or any other construction equipment—look to GM Diesels.

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GENERAL MOTORS
DIESEL POWER

Features of GM Diesels
Important to Every User of Power

- ***QUICK TO START*** on their own fuel
- ***LOW COST***—run on common fuel oil
- ***EASY TO MAINTAIN***—clean design plus accessibility
- ***LESS FIRE HAZARD***—no volatile explosive fuel
- ***COMPACT***—readily adaptable to any installation
- ***SMOOTH OPERATION***—rotating and reciprocating forces completely balanced
- ***QUICK ACCELERATION***—2-cycle principle produces power with every downward piston stroke

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GENERAL MOTORS

R. J. Newell, Regional Director for the Bureau of Reclamation, announced.

Nine projects in Idaho, Oregon, Washington, and Western Montana will benefit from the appropriation.

The accelerated construction program announced last winter for Reclamation projects in the Northwest will be continued on the Payette Division of the Boise Project and the Minidoka Project in Idaho, the Deschutes Project in Oregon, and the Roza Division of the Yakima Project and Columbia Basin Project in Washington.

Appropriations for construction of Anderson Ranch Dam on the Boise Project in Idaho, and pre-construction work on the Palisades Project in Idaho and the Hungry Horse Project in Montana, cut substantially from budget estimates, will allow only reduced progress to be made on these facilities, it was indicated.

The amounts appropriated for the various projects are as follows:

Payette Division, Boise Project, Idaho.—$2,782,659 made available. Scheduled work includes construction of Cascade Dam, an earth- and rock-fill structure which will store 700,000 acre-feet of water, relocation of 14 miles of the McCall Branch of the Union Pacific Railroad, relocation of county and state roads, and construction of a pumping plant and distribution system to serve the 25,000 acres to be brought under irrigation.

Work already is in progress on Cascade Dam, having recently been started by the Morrison-Knudsen Company of Boise. The relocation of 14 miles of the railroad, under the same contract, will be completed. A contract has been let for four pumps and a pumping plant to serve the new land and contracts also have been awarded for construction of canals and laterals.

• Haiss bucket loader loads three cu. yds. a minute to trucks off stockpiles in pit of New England Sand and Gravel Co., Framingham, Mass.

Anderson Ranch Dam, Boise Project, Idaho.—A budget estimate of $2,847,000 would have provided for completion of all earth placing on the embankment and substantial work on the spillway and outlet works of Anderson Ranch Dam. This figure was cut to $1,234,475, which will force a curtailment of most of the activities. Present plans are to continue the earth placing work as long as funds permit. A complete shut-down of all activities will probably be necessary in August or September.

Approximately 2,850,000 cu. yds. of material remained to be placed in the dam at the start of work this spring. The largest amount placed in any previous year was about 2,250,000 cu. yds., but substantial early progress was made toward a record year with nearly 350,000 cu. yds. of material going into the dam in June.

Palisades Project, Idaho.—An appropriation of $650,410 is available for preconstruction work and other activities on this project. It will be used chiefly for completion of exploratory core-drilling for the dam site, running lines for tunnel and outlet works, completion of a detailed survey of reservoir and dam site, and work on highway relocation surveys.

Investigation work, consisting principally of core-drilling and materials exploration has been under way for more than a year. The dam will provide a supplemental supply of water for a large area and will make possible the development of a block of new land in the Upper Snake River region. In addition, it will produce a sizable block of hydroelectric power and provide flood control benefits.

Minidoka Project, Idaho.—Soil lining, gravel blanketing, and puddling and grouting of certain sections of the 70-mile long Milner-Gooding canal, which has been leaking excessively, will be accomplished with the $1,000,000 made available for this purpose. In addition, laterals and other structures will be completed to serve several thousand new acres in the area.

Deschutes Project, Oregon.—All phases of construction work on the 50,000-acre North Unit of this project will be pushed to near completion with $1,716,837 made available by Congress. Primary work will include construction of the remaining 21 miles of main canal, including the Willow Creek siphon, construction of laterals to serve approximately 30,000 acres, completion of most of the work on Wickiup dam, and work on farm unit surveys and project development.

Bids were received on June 26 for construction of the main canal to the Willow Creek area. Bids for construction of laterals were opened on July 25.

Owyhee Project, Oregon.—An appropriation of $125,000 is available for continuing work on the Owyhee Project, which straddles the Idaho-Oregon border. This will permit completion of the Fletcher-Gulch wasteway, laterals, and drainage systems.

Roza Division of the Yakima Project, Washington.—Facilities to serve 25,000 acres by pumping from the 95 mile-long Roza Canal will be substantially completed with the $2,597,100 appropriation approved by Congress. These will include 17 pumping plants, excavation and structure work on the main canal, and laterals to serve the new land.

Award of contracts to Jose and Klug,

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Send for useful book based on data supplied by contractors, engineers, gravel producers, mine operators, etc. It's free.

At Sucker Flat Mine near Joplin, Mo., Sauerman equipment is succeeding where other equipment failed—solving the twin problems of stripping a thick layer of soft overburden and recovering zinc and lead ore from a deposit 145 ft. deep. Picture shows Sauerman Slackline Cableway moving ore to bin at rate of 75 tons an hour. It will take years to exhaust the ore within reach of the machine.

SAUERMAN BROS., Inc., 574 S. Clinton St., Chicago 7, Ill.

Yakima, for construction of 15 of the pumping plants has just been made. Contract for construction of a major wasteway was awarded on June 11 and a contract has been awarded on the lateral system for pump areas 3 and 4.

Columbia Basin Project, Washington.—Work on irrigation features initiated recently, will proceed under an $18,000,000 appropriation, which also includes funds for work on the powerhouses, and on additional generating units for Grand Coulee Dam. Irrigation work will consist mainly of construction on the main canal, the south and north dams of the equalizing reservoir, the feeder canal to this reservoir, the Long Lake and Potholes Reservoirs, laterals and pumps to serve 6,000 acres near Pasco, and pre-development and settlement activities.

Hungry Horse Project, Montana.—With an appropriation of $867,210 made available by Congress, preconstruction phases of the project, including topographic surveys, designs and specifications for clearing the reservoir, relocation of Forest Service and road facilities, work on camp facilities, and locating an access railroad and highway, will be continued.

Some portion of the work planned for the year will be curtailed. This includes clearing of the lower part of the reservoir area, completion of access railroad and highways, and preliminary stripping and other such work in preparation for the dam foundation.

Whitworth to Assist Lefebvre in New Mexico

E. M. Whitworth, who had been serving as an inspector for the Interstate Commerce Commission in the territory comprising Arizona and New Mexico, has been appointed administrative assistant to Arizona State Highway Engineer W. C. Lefebvre.

Prior to becoming an ICC inspector, Whitworth had been with the Arizona State Highway Department for many years. He joined the department in 1921 in an engineering capacity and later became a district highway engineer. Subsequently, he was named superintendent of the department's motor vehicle division, in which post he served nine years.

In his new position, Whitworth will assist the state engineer in special studies of road and highway building problems and in other matters involving operation of the department's engineering division.

Grader Shipments Increase

Graders shipped from manufacturing plants amounted to 1,321 machines valued at $6,055,486 during the third quarter of 1945 and 1,792 machines valued at $7,548,601 during the last quarter of the year, according to a report released by the Bureau of the Census. The fourth quarter shipments showed a substantial increase over the shipments during most of the war period. They were also above the quarterly rate achieved during the 5-year period pre-

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ELECTRIC PLANTS

• Some 20 years ago mining operations were begun on a four to 12-ft. thick vein of plastic clay in a 20-acre area near Castle Rock, Colorado, owned by H. G. Johnson. Cave-ins in these underground operations caused fatalities. Clay is now being mined by an open pit method with an International TD-6 crawler tractor equipped with a ½-cu. yd. Bucyrus-Erie Dozer-Shovel which removes the overburden and loads one truck which hauls the clay to a rail siding from where it is shipped to Denver and made into tile brick and pottery. Stroud Whisenhunt is owner and sole operator of both truck and tractor. Working eight hours a day Whisenhunt loads from 16 to 24 cars (60 tons each) a month. Here he is clearing the vein of overburden.

ceding the war, 1937-1941, almost reaching the high average quarterly levels attained in 1937 and 1941.

Graders of the heavy motor type constituted the bulk of the graders shipped during both the third and fourth quarters of 1945. There were 2,353 of these machines shipped during these six months. The remainder of the shipments were made up of 564 medium and light motor graders and 196 graders of types other than motor.

Award Honors for Safety in Mines and Quarries

An American open-pit mine and a quarry with outstanding safety records for 1945 were awarded "Sentinels of Safety" trophies in the 21st annual National Safety Competition sponsored by the Bureau of Mines, according to Dr. R. R. Sayers, Director of the Bureau.

A total of 74 mines and quarries, including underground mines, also were awarded Certificates of Honorable Mention for working 30,000 or more man-hours without an accident or for ranking in the next four places after the winner in each of the six classifications of mines, Dr. Sayers said.

Interest in the 1945 competition was keen, the Director reported to Secretary of the Interior Julius A. Krug, with 433 mines and quarries in 37 states and Hawaii participating in the contest for the bronze trophies which are donated each year by The Explosives Engineer magazine. The competition was inaugurated in 1925 to promote safety in the mines and quarries of the Nation.

Final results of the contest for last year also revealed that 86 mines and quarries worked nearly 6½ million man-hours without a single accident causing loss of working time by any employee. Describing the annual contests as an effective means of stimulating employee interest in preventing accidents, Dr. Sayers pointed out that the mines and quarries enrolled in the competition usually have better safety records than those not taking part. Competing mines and quarries average 49 injuries for each million man-hours worked, as compared with about 61 injuries per million man-hours for all mines and quarries in the United States. There are 500 plants already enrolled in the 1946 competition, Dr. Sayers stated.

The trophy winners in non-underground classifications are:

Stone Quarries:—The Bridgeport limestone quarry, of Bethlehem Steel Company at Bridgeport, Montgomery County, Pennsylvania, for working 379,948 man-hours without a lost-time accident.

Open-cut Mines:—The Mahoning iron-ore mine of the Pickands, Mather & Company (Mahoning Ore & Steel Company) at Hibbing, St. Louis County, Minnesota, for working 367,152 man-hours without a lost-time accident.

Following were winners of certificates of honorable mention for outstanding records among open pit mines: (All these mines operated during 1945 without a disabling injury)

Sagamore iron-ore mine, Riverton, Crow Wing County, Minn., operated by Pickands, Mather & Co. (Sagamore Ore Mining Co.).

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1 Improved, fabricated gooseneck with its greater built-in strength.

2 Positive, equalized braking at each wheel regardless of position of axle.

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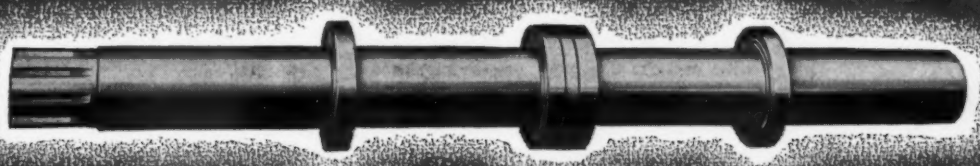
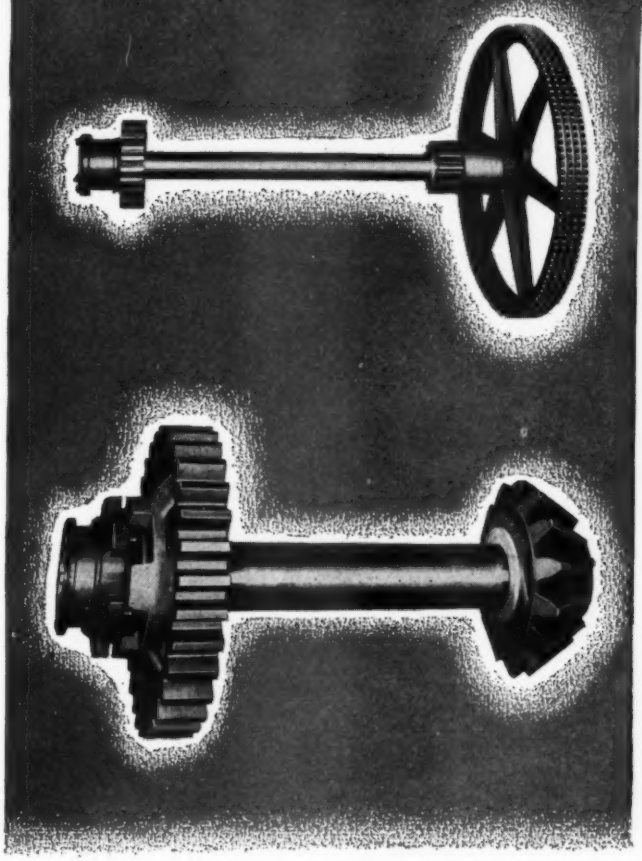


YOU CAN SEE THE STRENGTH OF THIS STRAIGHT, SPLINED SHAFTING



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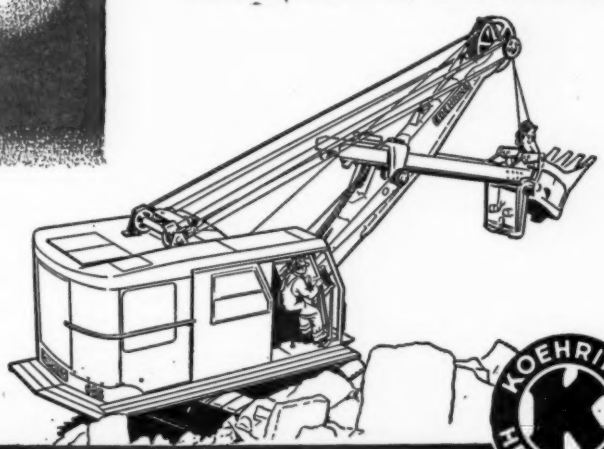

KOEHRING
605

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

• Hand-operated bucket excavator designed by Jacques Besson, professor of mathematics at Orleans where he died in 1569. The buckets are suspended on a chain operated by a man turning a handle. The considerable weight of the buckets filled with sand seems to be managed without much difficulty.

Photo from The Bettmann Archive

Corsica iron-ore mine, Elcor, St. Louis County, Minn., operated by Pickands, Mather & Co. (Corsica Iron Co.).

Bennett iron-ore mine, Keewatin, Itasca County, Minn., operated by Pickands, Mather & Co. (Bennett Mining Co.).

Biwabik iron-ore mine, Biwabik, St. Louis County, Minn., operated by Pickands, Mather & Co. (Biwabik Mining Co.).

Columbia phosphate mine, Columbia, Maury County, Tenn., operated by Monsanto Chemical Company.

St. Paul iron-ore mine, Keewatin, Itasca County, Minn., operated by Republic Steel Corporation.

Richmond iron-ore mine, Palmer, Marquette County, Mich., operated by The M. A. Hanna Company.

Harrison Group iron-ore mine, Cooley, Itasca County, Minn., operated by Butler Brothers.

Prenter bituminous-coal mine, Prenter, Boone County, W. Va., operated by the Red Parrot Coal Company.

Volunteer iron-ore mine, Palmer, Marquette County, Mich., operated by Palmer Mining Company.

Quarries

(All these quarries operated during 1945 without a disabling injury)

Bessemer limestone quarry, Bessemer, Lawrence County, Pa., operated by Bessemer Limestone & Cement Company.

Billmeyer dolomite quarry, Bainbridge, Lancaster County, Pa., operated by The J. E. Baker Company.

Bethlehem limestone quarry, Bethlehem, Northampton County, Pa., operated by Bethlehem Steel Company.

Security limestone quarry, Hagerstown, Washington County, Md., operated by North American Cement Corporation.

Ohio dolomite quarry, Millersville, Sandusky County, Ohio, operated by The J. E. Baker Company.

St. Stephens limestone quarry, Jackson, Washington County, Ala., operated by Lone Star Cement Corporation.

Birmingham limestone quarry, Tarrant, Jefferson County, Ala., operated by Lehigh Portland Cement Company.

Hudson limestone quarry, Hudson, Columbia County, N. Y., operated by Universal Atlas Cement Company.

Walford limestone quarry, Hillsville, Lawrence County, Pa., operated by Lake Erie Limestone Company.

Martinsburg limestone quarry, Mar-

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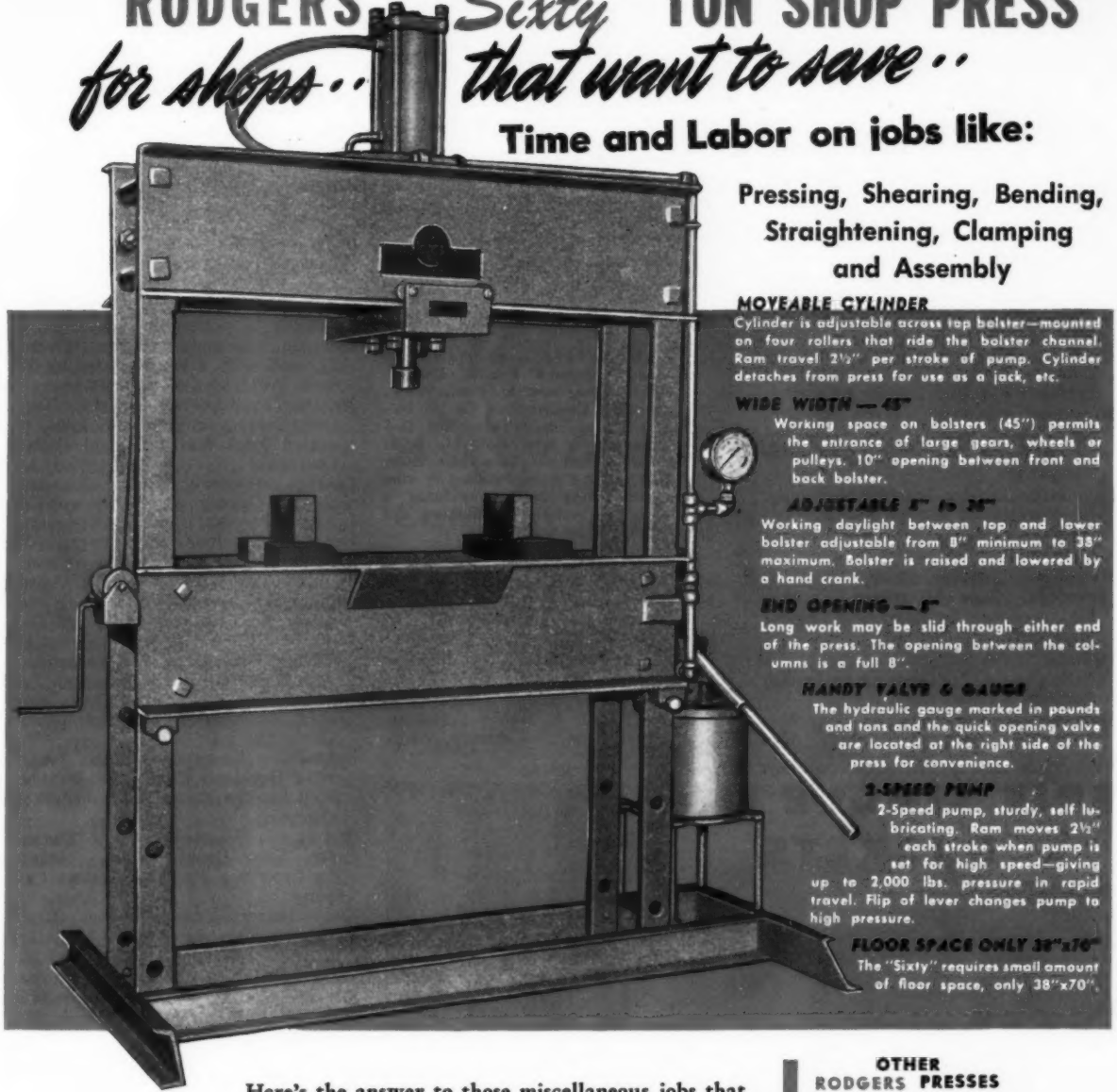

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Working space on bolsters (45") permits the entrance of large gears, wheels or pulleys. 10" opening between front and back bolster.

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Working daylight between top and lower bolster adjustable from 8" minimum to 38" maximum. Bolster is raised and lowered by a hand crank.

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2-Speed pump, sturdy, self lubricating. Ram moves 2½" each stroke when pump is set for high speed—giving up to 2,000 lbs. pressure in rapid travel. Flip of lever changes pump to high pressure.

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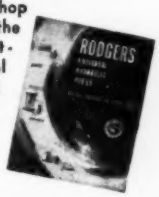

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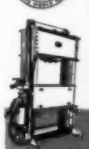
HYDRAULIC POWER EQUIPMENT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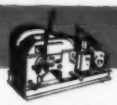

Power Pump Units

Portable Presses

tinsburg, Berkeley County, W. Va., operated by North American Cement Corporation.

Northampton cement rock quarry, Northampton, Northampton County, Pa., operated by Universal Atlas Cement Company.

Oglesby limestone quarry, Oglesby, La Salle County, Ill., operated by Marquette Cement Manufacturing Company.

Inwood limestone quarry, Inwood, Berkeley County, W. Va., operated by The J. E. Baker Company.

Fordwick Gay limestone and shale quarry, Fordwick, Augusta County, Va., operated by Lehigh Portland Cement Company.

Petoskey limestone quarry, Petoskey, Emmet County, Mich., operated by Petoskey Portland Cement Company.

Margerum limestone quarry, Margerum, Colbert County, Ala., operated by Alabama Asphaltic Limestone Company.

Fogelsville limestone-cement-rock quarry, Fogelsville, Lehigh County, Pa., operated by Lehigh Portland Cement Company.

Marquette limestone quarry, Cape Girardeau, Cape Girardeau County, Mo., operated by Marquette Cement Manufacturing Company.

Oglesby limestone quarry, Oglesby, La Salle County, Ill., operated by Lehigh Portland Cement Company.

Birmingham limestone quarry, Birmingham, Jefferson County, Ala., operated by Lone Star Cement Corporation.

• Installing 36-inch drain pipe along Northern Pacific Railway right-of-way near St. Paul, Minn., Standard Construction Co. of Duluth, Minn., uses Caterpillar D-4 tractor with Hyster double drum winch to pull pipe into place. Forty feet of pipe were installed in nine hours. Same tractor operated a dragline bucket for digging the ditch for the drain tile.

No. 3 cement-rock quarry, Coplay, Lehigh County, Pa., operated by Coplay Cement Manufacturing Company.

Blue Mount trap-rock quarry, White Hall, Baltimore County, Md., operated by The J. E. Baker Company.

White Haven sandstone quarry, White Haven, Luzerne County, Pa., operated by The General Crushed Stone Company.

Iola limestone and shale quarry, Iola, Allen County, Kans., operated by Lehigh Portland Cement Company.

Ft. Bellefontaine limestone quarry, St. Louis, St. Louis County, Mo., operated by Missouri Portland Cement Company.

Martins Creek limestone quarry, Martins Creek, Northampton County, Pa., operated by Alpha Portland Cement Company.

Greencastle limestone quarry, Greencastle, Putnam County, Ind., operated by Lone Star Cement Corporation.

Sylvania limestone quarry, Sylvania, Lucas County, Ohio, operated by Medusa Portland Cement Company.

Mason City limestone quarry, Mason City, Cerro Gordo County, Iowa, operated by Lehigh Portland Cement Company.

Catskill limestone quarry, Cementon, Greene County, N. Y., operated by Alpha Portland Cement Company.

Oro Grande limestone quarry, Oro Grande, San Bernardino County, Calif., operated by Riverside Cement Company.

Auburn limestone quarry, Auburn, Cayuga County, N. Y., operated by The General Crushed Stone Company.

Fort Worth limestone quarry, Fort Worth, Tarrant County, Texas, operated by Trinity Portland Cement Company.

Jordanville limestone quarry, Jordanville, Herkimer County, N. Y., operated by The General Crushed Stone Company.

Thomaston limestone quarry, Thomaston, Knox County, Maine, operated by Lawrence Portland Cement Company.

Genoa limestone quarry, Genoa, Ottawa County, Ohio, operated by U. S. Gypsum Company.

Thomasville limestone quarry, Thomasville, York County, Pa., operated by The J. E. Baker Company.

Alsen limestone quarry, Alsen, Greene County, N. Y., operated by Lehigh Portland Cement Company.

Sandt's Eddy cement-rock quarry, Easton, Northampton County, Pa., operated by Lehigh Portland Cement Company.

Dallas limestone quarry, Dallas, Dallas County, Texas, operated by Lone Star Cement Corporation.

Evansville cement-rock quarry, Evansville, Berks County, Pa., operated by Allentown Portland Cement Company.

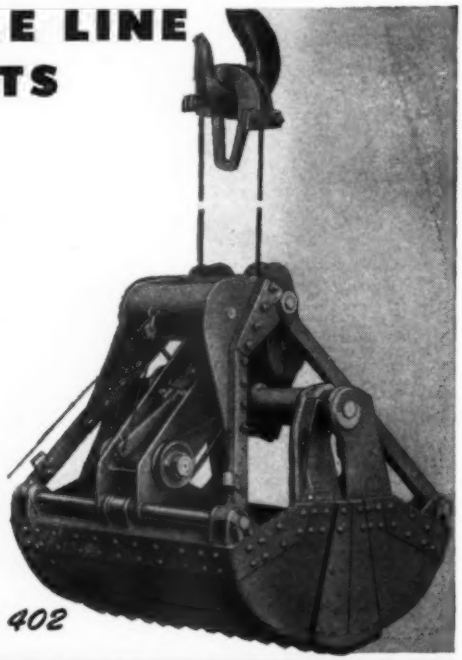
Hercules cement-rock quarry, Stockertown, Northampton County, Pa., operated by Hercules Cement Corporation.

No. 4 trap-rock quarry, Knippa, Uvalde County, Texas, operated by Southwest Stone Company.

Union Bridge limestone quarry, Union Bridge, Frederick & Carroll Counties, Md., operated by Lehigh Portland Cement Company.

Diamond limestone and shale quarry,

ERIE SINGLE LINE BUCKETS



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Middle Branch, Stark County, Ohio, operated by The Diamond Portland Cement Company.

National City gypsum quarry, National City, Iosco County, Mich., operated by National Gypsum Company.

Folsom State granite quarry, Folsom, Sacramento County, Calif., operated by Folsom State Prison Quarry.

Brazil Building Road From Coast Through Jungle

Brazilian army engineers have launched an ambitious project to connect the east coast of Brazil with its Bolivian frontier by a road that will open thousands of square miles of new area for settlers, mining engineers and lumbermen. For years, Brazilian military men have felt that the frontiers of their rich but sprawling republic were too inaccessible for adequate protection. Mining engineers have long believed that the high plateau lying between the Amazon and Paraguay rivers contained minerals worth exploiting. The new road will cut directly across the center of this plateau.

Two years ago, President Vargas took the first step by creating five new federal territories in strategic areas. States' rights are jealously guarded in Brazil, and bringing these strategic areas under federal control greatly facilitated the launching of the new road program.

Fully cognizant of the obstacles to be overcome, the engineers have planned only a one-lane road with frequent turnouts for the western end of the route, except in sections where construction is simple; here a full width road will be built. After the road has been pushed through, they plan to return and widen all one-lane sections to full width.

Rivers are too large and too frequent to be bridged, and will be crossed on steel-barge ferries. Each crossing will have a barge strung on a cable, and the barge will be cranked back and forth across the river manually. Barges will be fabricated on the site by welding steel plates together. Some of these barges are already in operation, and have proved satisfactory.

M. A. Hanna Co. Plans Iron Ore Exploration in Brazil

The M. A. Hanna Co., shipping and mining operators, through its subsidiary, Hanna Exploration Co., plan to explore large and hitherto undeveloped deposits of high grade iron ore outcrops in the Brazilian territory of Amapa, north of the Amazon river, according to Skillings' Mining Review. It is planned to make the ore available to world markets if the results of their work warrant the large investments that will obviously have to be made.

Skillings' Mining Review reports an announcement in Rio de Janeiro that Captain Janary Gentil Nunes, Governor of Amapa, acting with the approval of President Eurico Gaspar Dutra and other Brazilian government officials, had granted Hanna interests an option for a long-time lease to mine the Amapa ore and to build a 75-mile railroad from the ore deposits to the city of Macapa, capital of Amapa, on the northernmost mouth of the Amazon.

The venture will depend upon the results of an exploratory drilling campaign to be undertaken immediately under the direction of three members of the Hanna organization. The contract for the exploratory drilling has been let to Sprague & Henwood of Scranton, Pa., and actual work will start as soon as the equipment can be delivered to the deposits.

Year of Exploring

President George M. Humphrey of The M. A. Hanna Co. said that about a year of intensive work must be done on the property before his company can decide whether the operation will justify the large capital expenditures required for installing mining equipment and building the railroad and dockage facilities at Macapa, where the ore would be offered for sale to the markets of the world. If the decision should be made to go ahead with the project, the Hanna Exploration Co. will organize a Brazilian company to do the construction work, he said.

The contract with Governor Nunes was negotiated by H. L. Pierce, Hanna executive who has just returned to Cleveland after three months in Brazil. Mr. Pierce emphasized that exportation of the Amapa ore would place no hardship on the Brazilian steel industry, as

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• If you've bulk materials to haul between your job and stock pile, railroad siding or mixing plant, don't overlook B-G belt conveyors.

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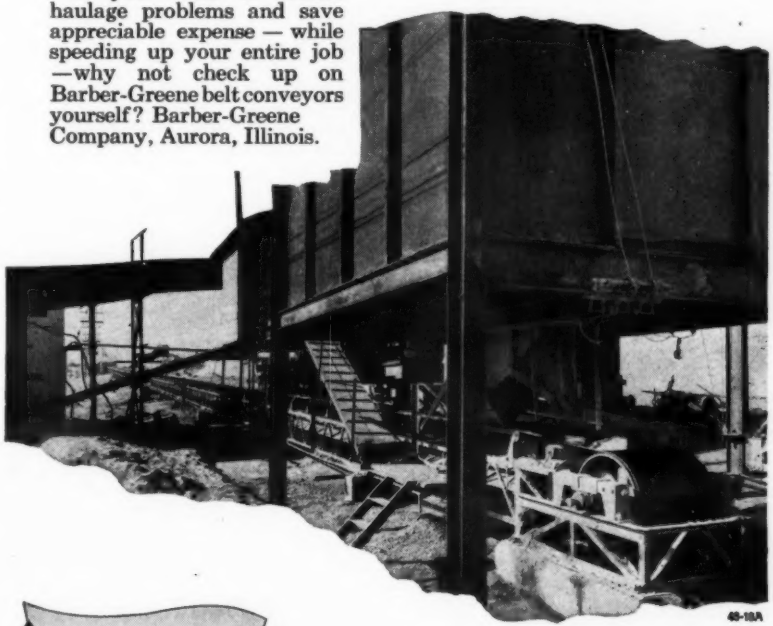
Barber-Greene belt conveyors are prefabricated, "packaged" units—simply built, easily erected. They often pay for themselves by eliminating the cost of rail or roadbed preparation. And they may be easily lengthened or shortened; they are not a "one-job" proposition.

If you want to reduce haulage problems and save appreciable expense — while speeding up your entire job —why not check up on Barber-Greene belt conveyors yourself? Barber-Greene Company, Aurora, Illinois.



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B-G Barber-Greene CONSTANT FLOW EQUIPMENT

• Central Pennsylvania Quarry Stripping and Construction Co. of Hazelton, Pa., use Bucyrus-Erie 6½ cu. yd. shovel to load overburden to Euclid trucks in anthracite field.

vast deposits are already being worked and shipped from the state of Minas Gerais and these deposits contain unquestionably sufficient ore to meet Brazil's domestic requirements for centuries.

Short Rail Haul

The Amapa ore deposits, which geologists believe may possibly contain extremely large tonnages of high quality ore recoverable by open pit mining, lie in the district of Santa Maria and can be delivered to deep water with a relatively short rail haul.

Until a few years ago, Amapa, a tropical wilderness lying directly north of the equator, was a part of the state of Para of the United States of Brazil. During World War II its potential importance as the northern bastion of the mouths of the Amazon was recognized by the Brazilian government and it was made a separate territory.

Diesel Manufacturers Expect Increased Demand

Demand for Diesel engines in the immediate future will far exceed the demand felt before the war, according to Harvey T. Hill, executive director of the Diesel Engine Manufacturers Association.

Four basic reasons have stimulated the market for Diesel power, Hill said.

"First, today's engines are better than those built before the war. Second, where Diesel engines 20 years ago were used almost exclusively for stationary and marine purposes, they are being built today for practically every type of application that calls for constant power."

A third consideration is the fact that the government purchased an enormous quantity of Diesel engines to be used in the war effort, then assigned thousands of service men to operate them—men who have returned to the business world well informed as to the Diesel's operating efficiency and economy.

A fourth stimulus to demand for Diesel power was the May coal strike, according to Hill.

Kansas Approves Farm-to-Market Road Project

As the initial step in a three-year improvement program expected to give Kansas one of the best secondary road systems in the nation, the Kansas State Highway Commission approved road construction projects totaling $7,945,146 for farm-to-market travel.

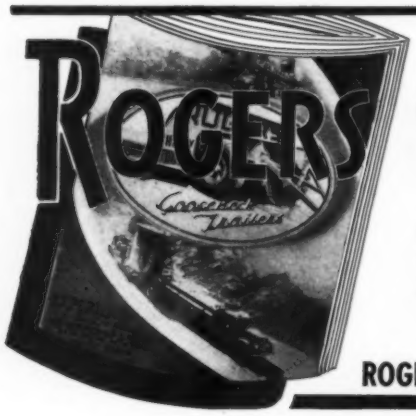
D. J. Fair, director of highways, said work on a large part of the roadways will be well under way by the end of summer. The projects approved came from 99 of the state's 105 counties, and include 1,843 miles of grading, draining and surfacing. Sixty-seven new bridges, critically needed in many cases, also are part of the approved projects.

While several counties asked for 15 to 25 miles of surfacing, others requested construction of bridge work as most urgently needed during the first year of the program. The surfacing includes both light and medium type of road base, which will give the counties a combination of black-top and gravel roads as feeders into the main highway system.

The program has been made extremely flexible so that one project can be substituted for another in case materials cannot be obtained. For example, a county asking for a steel bridge can proceed with road improvements if steel is not readily available. In this way, the allotment would not have to be forfeited because the work was unavoidably held up.

Road Construction Problems Discussed by AGC Group

The first meeting of the Committee on Economics of Highway Construction and Maintenance Methods, which operates under the Department of Economics, Finance and Administration of the Highway Research Board, was re-



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cently held in Salt Lake City, Utah.

Members at the informal meeting discussed the following subjects: (1) relation of overhead to size of job and safety factors in job management; practices; (2) operating characteristics and performance rates of equipment; (3) labor utilization; (4) material requirements; (5) relation of progress rates to specification and design requirements; and (6) maintenance by contract.

Harry J. Kirk, committee chairman, and manager of the Highway Contractors' Division of The Associated General Contractors of America, suggested that the program for this year should be divided into two parts: immediate objectives upon which definite progress might be reported to the annual meeting of the Highway Research Board, and comprehensive studies requiring long periods of time. Definite assignments will be announced.

PRA Offers Cooperation

The first meeting was devoted primarily to open the subject of committee activity to members and others invited to participate in its work, and to review suggestions on specific subjects to be studied in the future.

H. R. Fairbank, chairman of the Department of Economics, Finance and Administration, and Deputy Commissioner of the Public Roads Administration, has offered PRA's cooperation in the committee's work.

Scope of Subjects Covered

In the discussion on safety factors, F. W. Parrott, vice president of the A.G.C., expressed the opinion that safety is the contractor's problem. C. V. Isbell, A.G.C. director, Reno, Nevada, outlined valuable work that safety organizations could do in this field, and Morris E. DeWitt, chairman of the A.G.C. Highway Contractors' Division, reviewed the need for safety publicity.

The committee decided that there is a definite field of activity to undertake on operating characteristics and performance rates of equipment. Concern was expressed regarding the attitude of so-called efficiency experts when on the job, and the possible release of confidential information on operating ratio and unit costs. Kirk and Fred B. Farrell, chief of PRA's Highway Cost Section, gave assurance that the committee's work was to be viewed as a service primarily in the interest of the contractors.

Mr. Farrell said the PRA investigations on labor utilization would be devoted to such construction and maintenance items that are predominantly labor in nature.

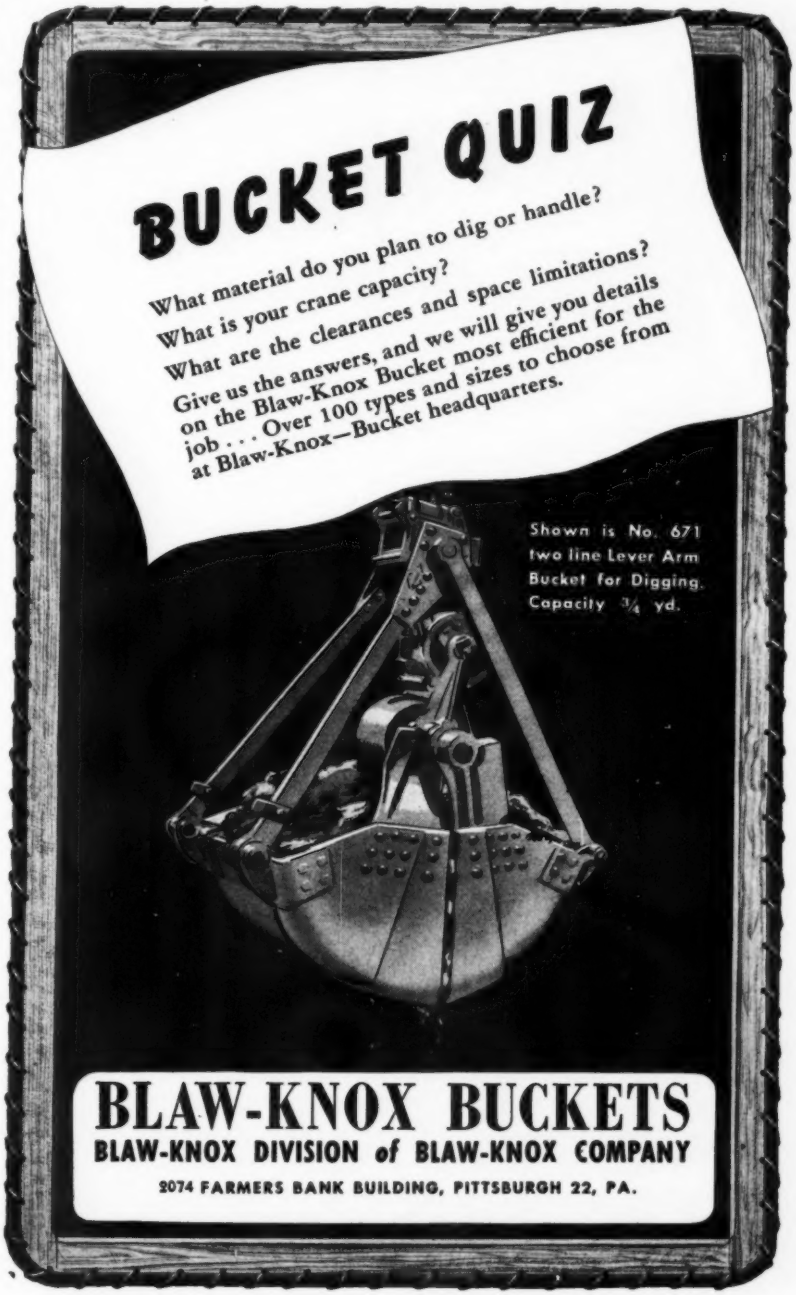
In the discussion of material requirements, it was suggested that a particular subject of study could be conducted upon those refinements of specifications which tend to prohibit the use of local materials, and that greater alertness should be stimulated in the use of local materials where available.

The following items under the subject of relation of progress rates to specification and design requirements were considered possible subjects for future study: (a) pavement joints: justification from standpoint of initial construction costs; (b) rounded slopes requiring considerable use of labor; (c) "sand-paper" finishing of slopes requiring considerable use of labor; (d) rubbing of concrete requiring use of labor and resulting in loss in wearing ability; (e) standardization of types of small drainage structures permitting re-use of forms; (f) elimination of headwalls on down-stream end of culverts; (g) ditch width (to be suited to available equipment).

Mr. DeWitt suggested that further study of maintenance work by contract be conducted, and stated that considerable success and economy was achieved in Illinois by letting certain maintenance work by contract. Several members discussed this subject, and it was generally agreed that it was practical to contract work for which accurate estimates and specifications can be made.

Authorize Construction of Colorado Projects

Secretary of the Interior J. A. Krug announced authorization of two contracts totaling almost nine and one-half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million dollars for constructing Horsetooth Reservoir on the Colorado-Big Thompson Reclamation project near Fort Collins, Colorado.

Horsetooth Reservoir, according to Commissioner Michael W. Straus of the Bureau of Reclamation, will be formed by the construction of four earth-filled dams and Satanka Dike. The reservoir will be about 6.5 miles long and from one-fourth to three-fourths of a mile wide, with high-water elevation at 5,430 feet.

A $5,111,877 contract for building Horsetooth Dam, the Satanka Dike, and the Soldier Canyon Dam has been authorized for award to a group of contractors composed of the following: Grafe-Callahan Construction Company, the Gunther and Shirley Company, both Nebraska firms, and W. K. McIlyar of Dallas, Texas.

Under a contract for $4,319,427, the Hinman Brothers Construction Company, a Colorado corporation, and Rhoades Brothers and Shofner, a partnership of Los Angeles, jointly, will construct Dixon Canyon Dam and the Spring Canyon Dam.

When the Colorado-Big Thompson project is completed, it will divert surplus waters of the Colorado River from the western slope of the Rocky Mountains through the Alva B. Adams tunnel under the Continental Divide to more than 600,000 acres of water-deficient irrigated lands on the eastern slope. A series of power plants will provide hydroelectric power for irrigation pumping, rural elecrtification, and the development of the mineral and other resources of the area.

A $6,000,000 contract for construction of Granby Dam, one of the key structures of the project, was recently awarded. Work is proceeding on several other important features of the project, including the Rams Horn and Prospect Mountain tunnels and facilities at Shadow Mountain Dam and the Adams tunnel.

North Dakota Group Favors Refund System on Taxes

To provide additional revenue for highway construction, North Dakota should replace its present state gasoline tax exemption law with a gasoline tax refund system, it was agreed by an overwhelming majority of the representatives of some 50 North Dakota organizations interested in highway improvement at a conference called by Gov. Fred G. Aandahl.

It was unofficially estimated that no tax is collected on 62 per cent of gasoline now being sold in North Dakota as a result of abuses of the present law exempting non-highway users. Most speakers expressed belief that the major part of present gasoline tax evasion, which drains revenue otherwise available for road improvement, came from commercial leaks rather than from farmers.

"The major leak is from the dealers," Governor Aandahl declared. He said that if every farmer in the state cheated on his gasoline tax and drove 10,000 miles a year on tax exempt gas, it couldn't account for the present evasion volume.

It was decided that the present gas tax law should be amended by an initiated act. Governor Aandahl indicated he might ask the North Dakota Postwar Highway Improvement Association to take the lead in initiating and drafting the proposal.

Texas Expects Record Yield From 1946 Gas Taxes

Brightening the outlook for Texas highway construction, State Comptroller George H. Sheppard has forecast a record-breaking yield of $69,000,000 from Texas gasoline taxes this year, $8,000,000 above the greatest previous year's receipts.

Significance also is attached to the sharp uptrend in tax receipts because of proposals for increased Texas gasoline tax rates and because Texas voters will decide at the November election whether to constitutionally restrict to road construction and maintenance purposes three fourths of the tax yield, with the other fourth going to school purposes. The allocation now is made by statute. The Texas Good Roads Association and other highway-user groups are campaigning for adoption of the constitutional amendment.

The pending constitutional amend-

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Alloy bearings corroded by unstable lubricants

The high pressures and temperatures in present-day Diesel engines greatly accelerate oxidation of some lubricants. Under such conditions, these oils tend to become corrosive and attack the lead in the copper-lead structure of alloy bearings. This leaves a porous copper shell which breaks down under pressure. The illustration shows how an alloy bearing looks after operation with an uncompounded oil.

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1. RPM DELO Diesel Engine Lubricating Oil base stocks are naturally resistant to oxidation, the cause of most lubricants becoming corrosive.
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DIESEL ENGINE RPM DELO LUBRICATING OIL

• The M-R-S Manufacturing Co. has modified this International ID-9 tractor by equipping it with a hydraulic system that brings the weight of the wagon to bear on the tractor's rear wheels when a hard pull is encountered.

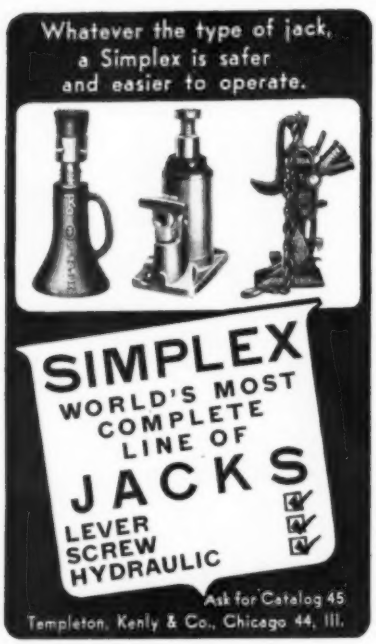
ment would apply only to present taxes. Proposals for increased gasoline taxes are expected to come before the 1947 Texas Legislature. Higher gasoline taxes have been advocated by two major candidates for governor—Dr. Homer Price Rainey and Jerry Sadler.

Texas gasoline tax collections for the first 10 months of the 1945-46 fiscal year totaled $55,934,679. This was $1,011,945 more than the state received from gasoline taxes in 12 months of the 1944-45 fiscal year and $11,712,894 more than the income from the corresponding 10 months.

Largest prior single year's gasoline tax revenue in Texas was $60,798,410 in 1941-42. Estimating that the summer vacation months of July and August will continue at the $6,437,884 rates compiled this June, the total for the current fiscal year, ending in August, would be $68,934,679.

Differing from the national trend, Texas has more automobiles, trucks and buses now than it had before the war. Texas traffic, as measured by the State Highway Department, is three per cent greater than ever before and approximately 40 per cent above last year.

Texas tax refunds to non-highway users amounts to slightly more than $1,000,000 a month. If the comptroller's estimates for the current fiscal year are fulfilled, the four-cent-per-gallon state gasoline tax will furnish about $14,000,000 for schools, $28,000,000 for the road construction and $14,000,000 for the state to pay county district and road bonds which it has assumed.



Maryland Has Record Road Program

Maryland road construction costing $17,000,000, either already under way or to be placed under contract before the end of the present construction year, will represent the largest amount of such work ever done at one time in the state's history.

In commenting on a report by the State Roads Commission, Governor O'Conor said projects already under construction amounted to more than $9,000,000, with additional work costing approximately $8,000,000 to be placed under contract within the next few months.

AED Attack Surplus Property Disposal Methods

"The Surplus Property Act of 1944 is proving to be an ineffectual and time-consuming means for disposing of surplus personal property of the Government in getting it into the hands of consumers."

This was the opening gun fired at the Surplus Property Act and its current enforcement, in a resolution adopted by the Board of Directors of Associated Equipment Distributors, at their semi-annual meeting in the Edgewater Beach Hotel, Chicago, June 17-19, which charged that "due to cumbersome procedures which are required by law, and the necessity for satisfying various groups of priority and preference holders, interminable delays are unavoidable. Moreover, the system of priorities and preferences established by the Act leads to the exploitation of priority and preference holders and puts a premium on fraud and dishonesty, and is therefore not functioning in accordance with the 20 objectives of the Act, or the original intent of the Act."

Because of widespread dissatisfaction with surplus disposal methods since the Act became operative throughout the construction machinery industry, whose stake in the surplus property picture runs into many millions of dollars, President F. B. McBath, of Portland, Oregon, President of A.E.D., had invited the organization's Committee on Disposal of Government Surplus to Chicago for a report on their findings during the past six months, and for two days of conferences prior to the Board of Directors' meeting. It was this Committee's report, and the succeeding conferences, which led to adoption of one of the most aggressive attacks yet launched by a national body against shortcomings of the Surplus Property Act and its administration.

The resolution adopted by the Associated Equipment Distributors at Chicago points out that "billions and billions of dollars of surplus are now in storage, little is being sold and that which is being sold is not finding its way into established or normal trade channels—rather it is being used to feed speculative markets." Rapid disposal now of surplus property would, A.E.D.'s Board of Directors believe, (1) retard inflation; (2) stimulate reemployment; (3) expedite reconversion; (4) help our housing program; (5) increase the food supply; (6) reduce the national debt by obtaining maximum dollar value; (7) prevent black markets; (8) retard speculation; (9) prevent excessive profits; (10) absorb the surplus when it can be done without shock to our national economy, and (11) discourage monopolistic practice and the hoarding of critical materials and equipment.

To further these ends, the resolution recommended elimination for an interim period of at least one year of all priorities, preferences and special privileges; disposal of surplus personal

property on the open market at public spot sales and at highest bid prices, sales to be publicly advertised well in advance, with utilization of normal channels of trade and commerce "to an extent consistent with efficient and economic distribution without discriminating against establishment of new enterprise."

Further recommendations were that goods be sold in small lots to afford all classes of prospective purchasers an opportunity to buy; that there be no negotiated transactions of any kind; that all surplus personal property be sold to obtain for the Government and the taxpayer the maximum value, regardless of other provisions of the Act; that where large inventories of surplus are concentrated in a small area, sales be handled on a national basis in order to get a wide and equitable distribution. Finally, A.E.D.'s Board of Directors resolved:

"That our national economy can best be served by a rapid dumping of surplus personal property during the interim period, but that the Government maintain a constant survey of market conditions to avoid dislocations of the domestic economy by retarding sales when such survey indicates an impact on industry."

February 13, 14, 15 and 16, 1947, was set as the time of A.E.D.'s next Annual Meeting, to be held at the Edgewater Beach Hotel, Chicago. Reports were made by 11 standing and special committees.

Call for Bids on Long Lake Dam Construction

To speed construction of the one-million-acre Columbia Basin reclamation development, a call for bids for the construction of Long Lake dam, 15 miles northeast of Ephrata, Wash., was announced by the Chief Engineer's office of the Bureau of Reclamation in Denver. Bids are to be opened at Coulee Dam, Wash., on August 7.

Approximately 1,500,000 cu. yds. of earthfill will be placed in the embankment of Long Lake dam which will have a crest length of 1,900 feet and a maximum height of 110 feet above the stream bed. Other features included in the work are the construction of an outlet works and an open channel spillway.

Construction of Long Lake dam is expected to begin late this summer.

Pan American Road Opens 1,498 Miles

It is now possible to travel over the Pan American Highway in Mexico from the United States border at Laredo, Texas, to San Cristobal Las Casas in the state of Chiapas, a total distance of 1,498 miles. When completed, this "main street of the Americas" in Central America will consist of 3,250 miles of all-weather road from Laredo to the Panama Canal. The highway is paved from Laredo to Mexico City, a distance of 762 miles, and is hard-surfaced 344 miles further to Oaxaca.

Oil Companies Construct Road in Venezuela

Plans have been completed by 11 oil companies to build a $9,000,000 highway through the oil states of Guarico and Anzoategui in Venezuela. The road will run from El Sombero through Puerto de Guante, around Lake Caribe, skirt Zaraza and Guaribe, go through Chaguaramas, San Miguel, Caigua, the important city of Barcelona, and end at Puerto La Cruz, an outlet for boat shipments of oil. Entire cost of the project will be born by the oil companies and in return, will receive concessions from the states of Guarico and Anzoateguil.

Start Work on Delta-Mendota Canal

Work on the great Delta-Mendota Canal, key link in the chain of watercourses comprising the irrigation system of the Central Valley Project, started in July, A. R. McGinness, head of the Bureau of Reclamation's Region II Design and Construction Branch, announced at Sacramento.

Contractor Hubert H. Everist, Sr., of San Francisco, began the job with construction of a 13-mile stretch paralleling the SP tracks between Westley and Patterson in Stanislaus County, on the Eastern slope of the Livermore

(Continued on page 452)

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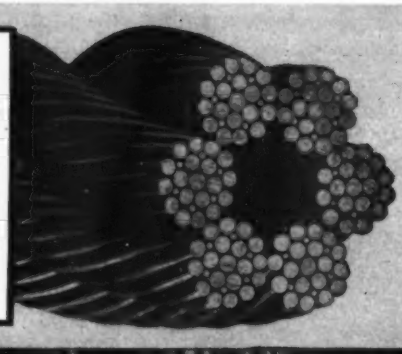

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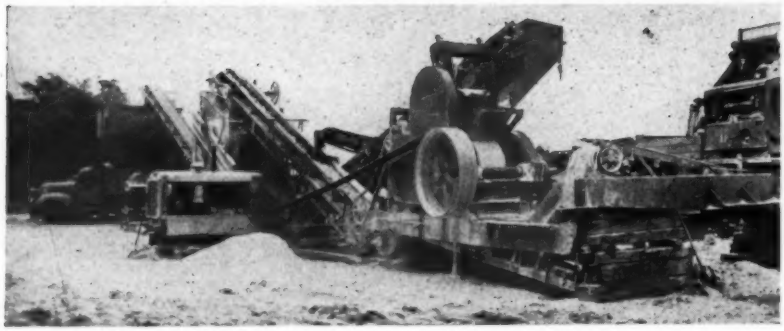


• After winter plays its havoc, spring brings out thousands of road repair crews all over the country. Here ditches are being cleaned and the crown reshaped with an Allis-Chalmers "W" Speed Patrol.

Shots from the Firing Line

(Continued from page 449)

hills, for which his bid of $3,530,067.50 was low.

The Delta-Mendota Canal is a concrete-lined river, 100 feet wide and 15 feet deep, which will carry Sacramento River water from the Delta 120 miles into the depths of the San Joaquin. There, at Mendota, in western Fresno County, it will collect in the Mendota Pool, a reservoir which will feed San Joaquin River lands, left short of water when the Friant-Kern Canal diverts most of their original supply down to the dry country in Tulare and Kern Counties.

Headworks of the canal will be above Tracy, near the exact spot where Alameda, Contra Costa and San Joaquin Counties meet at a bend of Old River, a former main channel of the San Joaquin. Old River's bed will be deepened to reverse its flow and draw water out of the Delta into a pumping plant, which will force it uphill through three mile-long, 15-foot pipes, which will empty into the beginning of the canal at an elevation of 200 feet. From there on, a grade of four inches to the mile will carry the water down into the San Joaquin by gravity.

Contract for the pumps will be let this month, and the pumping installation is to be completed before July, 1949, by which time the whole length of the canal will have been finished. Cost of the canal, the pumping systems and rights-of-way, will be about $70,000,000 at 1945 prices, he said. Over 450,000 acres in the West Side area around Mendota and along the course of the canal will be irrigated by the water it carries.

The canal can accommodate 4600 cu. ft. of water per second, three times the average flow of the San Joaquin River. The pumps which will lift this mass of water to the beginning of the channel will require approximately one-third of the power generated at Shasta and Keswick Dams. They will get this power over government transmission lines if the plan originally approved by Congress is carried out, said McGinness.

Award $2,771,887 Job On South Dam at Coulee

A $2,771,887 contract for constructing a 10,000-foot earth-and-rock dam across the Grand Coulee at Coulee City, Grant County, was awarded by the Bureau of Reclamation to the Spokane firms of Roy L. Bair & Company and James Crick & Sons.

The award was announced by Walker R. Young, chief engineer for the Bureau, at Denver. It is the second contract let for construction work on the multi-million-dollar Columbia Basin Project irrigation system. The Morrison-Knudsen Company of Boise recently began work on a 6½-mile section of the Main Canal east of Soap Lake under a $619,000 contract.

The contractors will have nearly 2½ years to complete the structure, one of four big dams to be built as part of the irrigation system which will carry Columbia River water to the 1,000,000-acre project in south-central Washington.

Known as the South Dam, the barrier will be 450 feet wide at its base, will have a maximum height of 65 feet, and will be composed of 1,500,000 cu. yds. of compacted soil, sand, gravel and rock. This dam, and its companion North Dam, will create a 27-mile equalizing reservoir in the Grand Coulee, great gash cut through solid rock by the Columbia's glacial ancestor. The world's biggest pumping plant, being built at Grand Coulee Dam, will lift Columbia River water into the reservoir.

The contract includes construction of the first 2,400 feet of the Main Canal, which will run southeasterly from the South Dam.

Gas Tax Increase Offsets Rising Construction Cost

John S. Redditt, chairman of the Texas State Highway Commission, predicted that rising highway construction costs would be offset by increased gasoline tax revenue, permitting Texas to complete all projects in its three-year program as planned.

Fears had previously been expressed that the increased cost of materials and labor would substantially reduce the mileage of highways that could be built during the first postwar years.

"Our highway program is now moving along satisfactorily," Redditt said. "It appears we will be able to continue awarding new contracts monthly, permitting us to finish our program on schedule."

Morrison-Knudson Co. Gets Cascade Dam Contract

A $1,396,889-contract for the construction of Cascade Dam on the North Fork of the Payette River in southwestern Idaho has been authorized for award to the Morrison-Knudson Company of Boise, Idaho, Secretary of the Interior J. A. Krug announced.

Located a mile north of the town of Cascade, the dam, to be built under the direction of the Bureau of Reclamation, will be an earth- and rock-fill structure 800 feet long and 80 feet high. Its reservoir will have a capacity of 700,000 acre-feet.

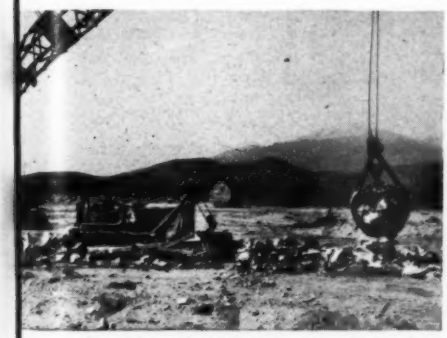
Commissioner of Reclamation Michael W. Straus said that Payette river water stored in this reservoir will provide irrigation for about 25,000 acres of new land in the vicinity of New Plymouth and Middleton, including 4,600 acres of public land to be opened for veteran settlement. An additional 85,000 acres in the Emmett Valley will receive a supplemental water supply. These lands have suffered from periodic water shortages with resultant crop losses. The Bureau's comprehensive plan for developing the Boise project contemplates the diversion of about 400,000 acre-feet of surplus water from the Payette basin into the Boise basin

ALL THE WAY WITH "CATERPILLAR" DIESELS

Keen, business-minded contractors don't risk repeated purchases of costly equipment that can't show evidence of long-lived performance and dependability. It is on that sound basis that the seven important phases of the Lytle Creek (California) Flood Control Project pictured here overwhelmingly featured "Caterpillar" Diesel equipment. Note the number of units "zoned" to the various jobs.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

1. Seven Diesel Tractors operating scrapers.

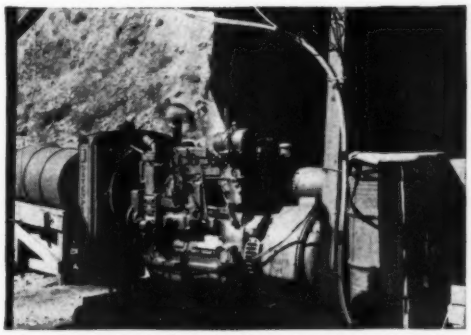


2. One Diesel Tractor bunching rock with rock rake.

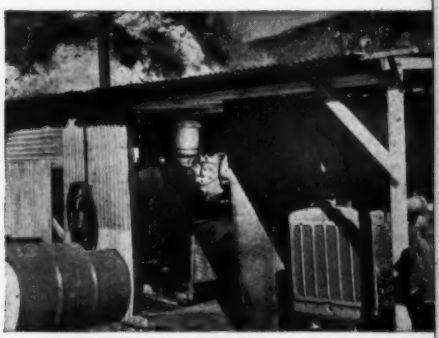
3. One Diesel Engine powering shovel.

4. Two Diesel Tractors grading levees.

5. Two Diesel Tractors bulldozing rock for rip-rap.



6. One Diesel Electric Set supplying power for repair shop, quarry lights and gas pumps.



7. Two Diesel Engines operating compressors.

CATERPILLAR DIESEL

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ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

—for lowest costs on earth

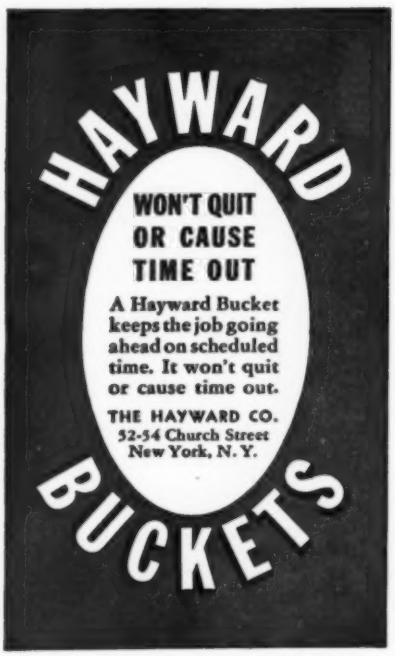
• After winter plays its havoc, spring brings out thousands of road repair crews all over the country. Here ditches are being cleaned and the crown reshaped with an Allis-Chalmers "W" Speed Patrol.

for irrigation, power production, and other purposes.

Work on Cascade Dam is scheduled to start within 30 days of the date on which the contractor is notified to proceed. About two years will be required to complete the structure, Straus said. More than 470,000 cu. yds. of earth and rock will be excavated during the construction operations.

Other work to be done under the contract includes the relocation of 14½ miles of railway, construction of a mile of telegraph line, excavation and concrete lining of a 12-foot diameter tunnel more than 300 feet long through an abutment of the dam, construction of bridges, highway crossings and other structures, and the installation of equipment and control works at the dam..

Work on the project was initially started in 1941, but was shut down in 1942 by order of the War Production Board to conserve materials and manpower for wartime needs.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WON'T QUIT
OR CAUSE
TIME OUT
A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.
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BUCKETS

Commissioner Straus said that the work of clearing the reservoir site will be carried on simultaneously with the construction of the dam. He announced that a $191,000-contract has been awarded to the Wixon and Crowe Company of Redding, California, for clearing part of the reservoir area of timber and brush.

Another major dam under construction by the Bureau as part of its program for full development of water resources in this area is the Anderson Ranch Dam on the south fork of the Boise River, 40 miles southeast of Boise. Now more than 75 per cent complete, this structure will be the highest earth-fill dam in the world, rising 444 feet above stream-bed. Its reservoir will provide a supplemental water supply for 300,000 acres and a power plant at the dam will have a generating capacity of 40,500 kilowatts.

Dominican Republic Plans Construction Projects

The Dominican Government has signed a contract with a United States company providing for the construction of aqueducts in the towns of La Vega, San Francisco de Macoris, and Puerto Plata, according to the Office of International Trade, Department of Commerce.

The Department of Public Works also has a program for street paving and the construction of an airport and model hotel in Long Beach, Puerto Plata, in the northern part of the Republic.

Expand Argentine Airports

The Argentine Government has authorized the construction of six major airports and improvements to several already in operation, according to the Office of International Trade, Department of Commerce.

The new airports will be built at Cordoba, Salta, Resistencia, Comodoro Rivadavia, Formosa and Clorinda at an estimated cost of $875,000.

Largest of the new airports will be at Cordoba, in the village of Pajas Blancas.

Peru's Road Building to Meet Nation's Needs

During the past decade Peru has made notable progress in building a highway system adequate for the needs of that country. Progress has been made in surfacing the Peruvian section of the Pan-American Highway and according to the Bureau of Foreign and Domestic Commerce of the U. S. Department of Commerce, mileage of surfaced roads in Peru increased 92% between 1936 and 1944.

The highway system of Peru at the end of 1944 totaled 20,350 miles. On the basis of area per mile of road, Peru ranks 13th among the American republics. As of December 31, 1944, 12,269 trucks, 1,278 buses and 15,774 passenger cars were registered in Peru. The number of motor vehicles per mile of road was 1.4. Peru ranked 10th in number of vehicles per mile.

Within the country the growth of highway transportation compares favorably with the development of other transportation media. In 1944 there were 2,650 miles of common-carrier and industrial track. Navigable inland waterways in the region east of the Andes total between 3,000 and 4,000 miles, but serve only as an eastward outlet, except where connecting highways extend westward.

In view of the economic disadvantages of rail transportation and the geographic limitations of water transportation, the construction of highways seems to offer the best solution to the problem of developing a transportation system adequate to bring about the full economic growth of the country.

Blue Mountain Dam Under Way in Arkansas

The S. E. Evans construction company has a $1,010,447.80 contract to complete Blue Mountain Dam which is under supervision of the Southwestern Division of the Corps of Engineers, Little Rock District.

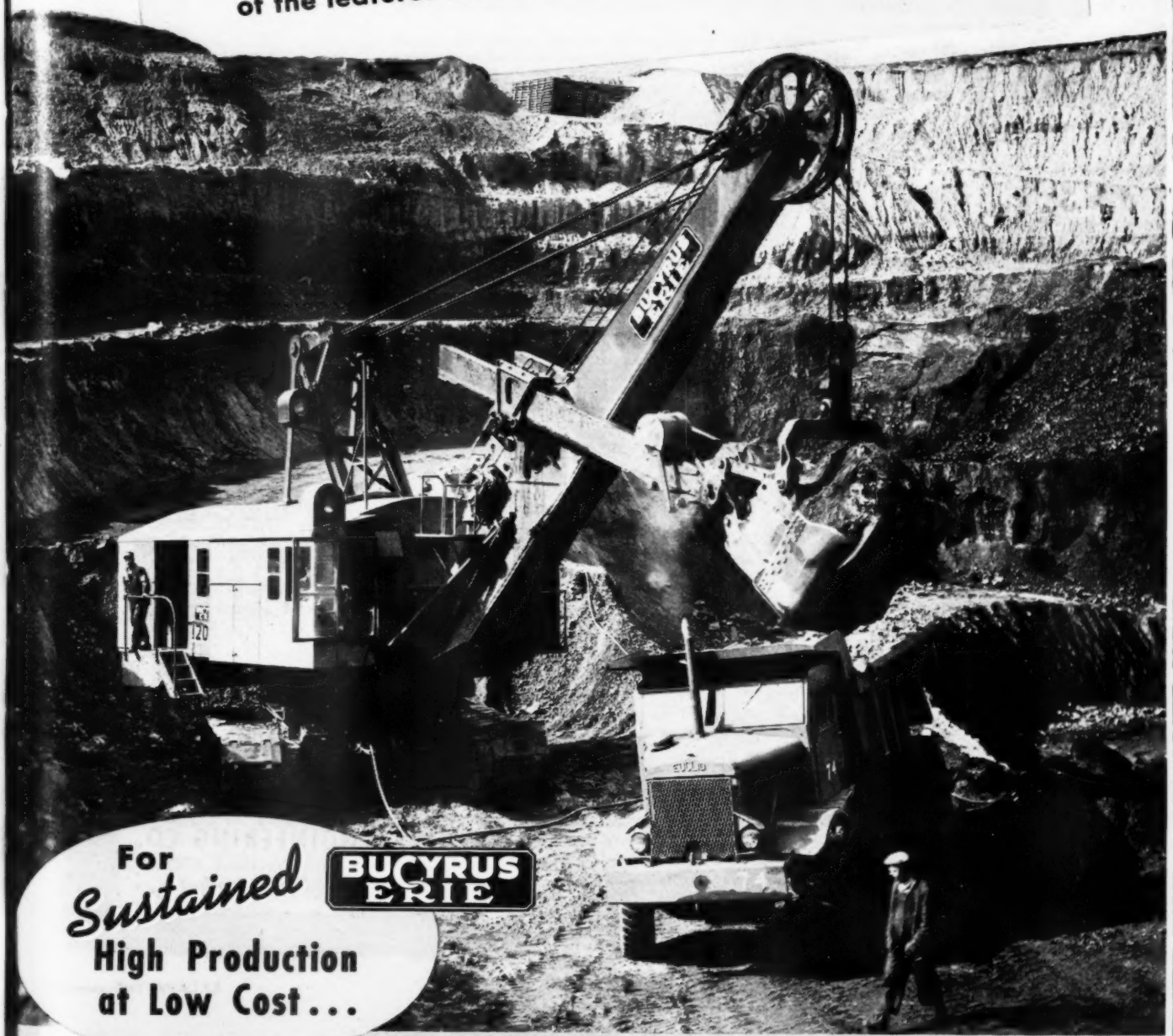
On the Petit Jean River 55 miles southeast of Fort Smith, Arkansas, the project is a unit in the comprehensive plan for flood control in the Arkansas River Basin and is designed to control the run-off from a drainage area of about 500 square miles. Project structures consist of a saddle spillway in the left abutment, a rolled earth-fill dam, and a tunneled outlet works in the right abutment.

The spillway, a concrete structure of the uncontrolled chute type, will be located in a natural low saddle in the left abutment about 1,200 feet downstream from the dam axis. It will be 150 feet wide at its weir crest elevation of 419 feet above sea level. A 730-foot long approach channel will be provided,

A JOB FOR A LONG-TERM SHOVEL

Loading iron ore on the Mesabi Range places extra premium on the 5-yard 120-B's longest suit—ability to deliver a long-term average of high production and economy. Massive strength, minimum weight, high speed cycle, low power consumption, these are some of the features that keep Bucyrus-Eries "years ahead."

23L48C



For *Sustained* High Production at Low Cost...

BUCYRUS ERIE

• As recently as the '30s horses and scoops were used for highway excavating work in New Zealand.

and an outlet channel, extending 540 feet from the weir, will lead to a natural draw that enters the river channel approximately 1,500 feet downstream from the toe of the dam.

The embankment, of rolled pervious and impervious material, will have a maximum height of 82 feet above the flood plain. It will be 25 feet wide at the crest and will have a maximum width of 650 feet at the base.

The reservoir will have a total storage capacity of 258,000 acre-feet at the spillway crest level. Of this amount, a permanent conservation pool will contain 25,000 acre-feet. The remainder, 233,000 acre-feet, will act as flood-control storage between the conservation pool level and the spillway crest. At spillway crest level, the reservoir area will be about 11,000 acres and will have a length of about 19 miles and a maximum width of approximately two miles.

Already constructed at this project is an outlet works consisting of a 20-foot diameter circular tunnel, controlled by three 8-foot by 17-foot gates and having a capacity of 12,250 cu. ft. a second. A removable weir 60 feet long with a crest at elevation 383 will obviate continual manipulation of the outlet gates in maintaining the conservation pool. The weir will control outflow up to elevation 394.

Federal Government Chief Civil Airports Contributor

Prior to 1933 about half of the 150 million dollars spent for civilian airports came from private and commercial sources and nearly all of the other half from municipal funds. Federal funds amounted to less than one percent, and state funds to only two percent of the total.

During the depression years from 1933 through 1940 the Federal Government was looking for projects to absorb a large amount of manual labor and the government invested freely, spending almost three-quarters of the 273 million spent for civilian airports. Most of the remaining quarter came from municipal sources. The amounts of state funds and commercial and private funds were very small by comparison.

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Work Under Way at Wister Dam in Oklahoma

Contractors have moved equipment into the area and construction is getting under way on the Wister Dam on the Poteau River in eastern Oklahoma. Groves, Lundin and Cox of Minneapolis, Minn., has the main contract, in the amount of $4,016,727.

Authorized by the Flood Control Act of 1938, the project is included in the general comprehensive plan for flood control and other purposes in the Arkansas River Basin. The dam site is two miles south of Wister, Oklahoma, and 35 miles southwest of Fort Smith, Arkansas.

Designed, and being constructed, under supervision of the Corps of Engineers, this project consists primarily of a rolled-fill earth embankment, an uncontrolled chute-type spillway, and outlet works consisting of a conduit, gate tower, gates, and appurtenant facilities.

The completed embankment will be 13,100 feet long, will contain 2,225,000 cu. yds. of impervious fill, will be 25 feet wide at the crest, and will have an average height of 68 feet above the valley floor. Its slopes will be protected from wave action and weathering by rock. A 40-foot high dike will extend 2,400 feet from the right abutment and its construction will be similar to that of the main embankment.

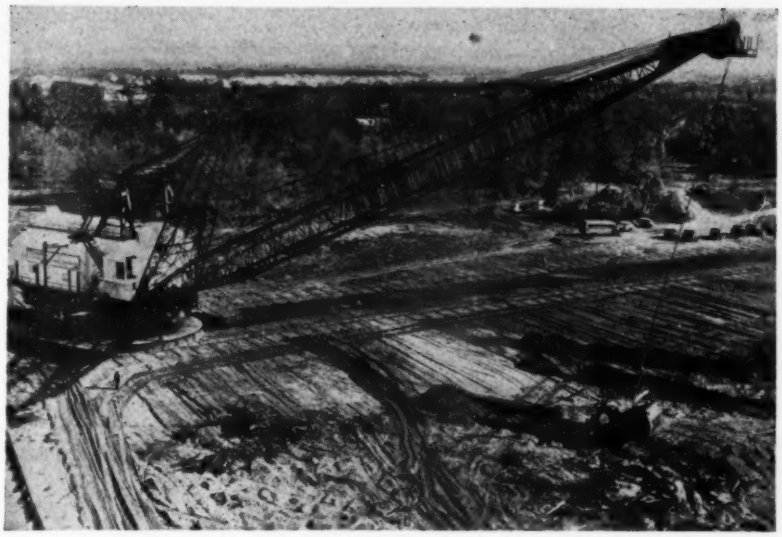
The uncontrolled spillway will be constructed through a ridge which extends downstream from the right abutment of the main embankment. It will have a crest length of 600 feet, and a paved apron will extend 17 feet upstream and 103 feet downstream from the crest of the weir.

The outlet works will be located in the valley adjacent to the right abutment of the dam, between the main embankment and the spillway. The concrete conduit, which will extend beneath the main embankment, will have twin "D" shaped passages 16 feet wide and 12 feet 10 inches high, and will terminate in a stilling basin. The gate tower will be a monolithic concrete structure, and flows will be regulated by six 7-foot by 12-foot vertical-lift gates operated by individual electric hoists. There also will be an emergency gate and a conduit for low-flow regulation.

The top of the dam will be at elevation 527.5 feet above sea level and at this contour the reservoir will have an area of 35,800 acres. At the spillway crest elevation of 502.5 feet above sea level the reservoir area will contain 23,000 acres and will have a capacity of 430,000 acre-feet. The conservation pool elevation, level at which the pool normthis level 30,000 acre-feet of water will inundate 4,000 acres.

Spend Over Two Million On Venezuelan Airfields

More than $2,100,000 will be spent on airfields in Venezuela this year, the Minister of Public Works announced. The plans include a new airport at Caracas, capital city, big improvements to the terminal, field and road leading to the city at Maracaibo, second largest city, a new field at Puerto Cabelle in the state of Carabobo, and repairs to other fields throughout the republic.



• International Mineral & Chemical Corp. uses a Bucyrus-Erie 1150-B walking dragline with a 215-ft. boom and 20-cu. yd. bucket for digging phosphate at its Peace Valley Mine in Florida.

Arizona Highway Construction To Cost Eight Million

Appropriations totaling more than $8,000,000 for highway construction will be included in Arizona's highway budget for 1946-47, according to announcement (May 17) by Gene Eagles, secretary of the State Highway Commission. The figure includes all state, county and federal funds which are estimated to be available this year.

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Your Loader Lasts—for Years
• 3, 5, or 8 yds. capacity—your drivers don't wait.
• Alloy steels... Haiss-designed heavy-duty transmission... clutches and gears running in oil mean stamina and long life.
All These Add up to "Lowest Cost per Yard"
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NOT in the Contract

The three salesmen wanted to discuss some things at lunch but couldn't find an empty table. They sat at one where a little, elderly woman was eating. One said: "You know boys, it's been three weeks since I've been able to take a bath." The second caught on quick and said: "Hell, it's been six weeks since I've had a bath." "Shucks, you guys are plumb clean. I haven't had a bath since last August," claimed the third.

They waited to see what would happen. The little old woman finally piped up: "Will one of you stinkers please pass the salt?"

Customer: "So now you and your son are carrying on the business together?"

Contractor: "Not exactly. I run the business and my son does the carrying on."

Drill Salesman: "You make only a small deposit and make no more payments for six months."

Contractor: "Who told you about us?"

A young American-born boy of an immigrant family informed his teacher one day, "If my father tries to whip me again, I'll run away."

"But, Tony, objected the teacher, "your father has the right to punish you if you are bad."

The boy threw back his head proudly. "I'm a citizen of the United States," he declared, "an' no damn foreigner's gonna lick me, you bet."

"Well, well, Joe, so you've signed up as captain on the good ship Matrimony?"

"Nope, only second mate. I married a widow."

"Stop beefing! You know there's still a truck shortage!"

"Well, Johnny, how did you get along in school today?"

"Okay, Mother, but that new teacher is always asking us some fool question. Today she asked everybody where they were born."

"Well, you certainly knew the answer to that—the Woman's Hospital."

"Betcha life I knew! But I didn't want the whole class to think I was a sissy. I said the Yankee Stadium."

"What's the matter, dear? You look flustered."

"Oh, I've had a dreadful day! First, baby cut a tooth; then he took his first step; then he fell and knocked out his tooth."

"Then what?"

"Then he said his first word!"

A drunk was walking down the street with a big pink elephant following him. From time to time they would converse in friendly fashion, but finally the elephant got too chummy and began to rest its trunk heavily on the fellow's shoulder.

"Look here, you," said the drunk. "If you don't cut that out, I'm gonna take a couple aspirins and get rid of you!"

"Look at that guy walking ahead of us. He's got a grapefruit stuck in each hip pocket."

"You're wrong. Those ain't grapefruit and that ain't a him. It's a her."

This story serves as a pretty good illustration of one aspect of inflation.

A man noticed one morning that his newsboy had a puppy on his stand with a "For Sale" sign over him. Idly he asked the boy how much he expected to get for the dog.

"Fifty thousand dollars," replied the youngster. "I won't take a cent less." The man whistled and passed along.

"A few mornings later the man noticed the dog was gone. "Sell your dog?" he inquired.

"Yep," the boy grinned.

"Did you get your price for him?"

"Yep. Took a couple of twenty-five-thousand-dollar cats."

Now Available . . .
Wire Countered Primacord

For extra deep, well-drilled holes we recommend Primacord-Bickford Wire Countered Detonating Fuse. It is made with a brass wire binding covered with cotton yarn and wax coating. This wire countering increases the tensile strength of Primacord to 220 pounds, and also makes it more resistant to abrasion. It weighs only 35 pounds per thousand feet: packed on wooden spools it is easy to handle in the field . . . ideal for use where the going is tough.

Primacord-Bickford Detonating Fuse is made in two other standard types: Plain Primacord, for shallow holes, and for all surface trunk lines; Reinforced for deep holes where tensile strength is needed.

All three types of Primacord have the same built-in time delay feature for efficient shot sequence. All offer the same easy hook-up with square knots and half hitches. All guarantee absolute freedom from the hazards of stray currents, for the cap is not attached until ready to blast. Three more reasons why Primacord is recognized as the father of modern blasting.

Also
ENSIGN-BICKFORD SAFETY FUSE
Since 1836

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PRIMACORD-BICKFORD
Detonating • Fuse •

Florida Mining

(Continued from page 419)

Bucyrus-Monighan 6-W electric walking dragline with a 8-cu. yd. bucket on a 125-ft. boom for the removal of overburden. The draglines are also used to mine the phosphate matrix which varies from three to 19 feet in thickness. This phosphate-bearing matrix is piled near a sump where it is worked down by hydraulic guns and then pumped by a centrifugal pump, operated by a 300 h.p. motor, through a 14-inch pipe to a washing and sizing plant 4000 feet away. The draglines work 24 hours a day, 14 hours in moving overburden and 10 hours in mining phosphate. Three nozzles with pressures of 110 to 120 lbs. per sq. inch move 500 cu. yds. of solid material per hour. About 50 acres of the 2250-acre tract are mined per year with each dragline.

After the clay is washed out of the phosphate-bearing matrix, and the phosphate pebbles screened and crushed to required sizes, the material is dried and moved to the company's main plant at Nicholas where it is stored according to grade.

The success of phosphate mining is dependent upon agricultural activity, according to a Florida State Bulletin. The farmer must have phosphate for his money crops, and about 90 percent of the tonnage of raw phosphate produced in Florida is used in fertilizers and feeds. Phosphate compounds utilized in industrial chemistry, warfare and medicine account for the remaining 10 percent.

Bulldozers

(Continued from page 418)

moved off the location, as had been the spudder which drilled-in the well. The pump jack was set and the well connected to a carrying pipe line.

The 'dozer combined two jobs into one. First a 200-foot long roadway had to be roughed through thick underbrush directly past the new well to provide access to another location established farther on. Second, the slush pits for the finished well had to be back-filled. This situation gave the bulldozer operator a good chance to dispose easily of the branches, twigs, and general rubble accumulating from clearing the roadway. Sending his bulldozer into the underbrush, the operator soon had a big load of brush on his blade. This material he 'dozed directly into the water, mud, and oil-filled slush pits. Every blade load ended there, and all the brush was later buried with dirt backfilled into the pits.

The foregoing operations are, of course, only a small segment of the excavating done daily in both the Mattoon and Brownsville areas. Like all new fields, they are being rapidly drilled up by both major oil companies and independent operators who are quick to take advantage of new reserves. Until the fields are thoroughly drilled, there will unquestionably be plenty of 'dozers on the scene for the bulldozer has thoroughly proved its "roughneck" abilities—and that's what the oil fields have looked for ever since the first petroleum well was drilled in Pennsylvania in 1859.

Shovel Loading

(Continued from page 423)

grees of swing angle is set as a limit, it is surprising how much material can be loaded within a 45 degree angle of swing.

It is understandable why some operators fall into a habit of delaying the change in shovel digging position and haul unit loading point. When the units are backed into place they make a track which succeeding units can easily follow to the correct loading point. When all of the drivers have learned just how to manipulate their vehicles to reach this point with the least delay, the shovel operator hesitates to make a change which will upset the clock-like movement of material and vehicles.

Because he is reluctant to disturb a set-up which at the moment functions smoothly, the shovel must bore deeper into the digging face to reach material and the dipper swing angle is increased. The operation of digging and loading is still smooth, but the loading time has increased and the output has decreased because of the longer swing.

Prolonged loading in one position may result in considerable material which has spilled from the dipper or from a well-filled truck piling up on the pit floor. This makes the truck road rough and the units either cannot get all the way back to the correct position or at best must be loaded while the unit is not level. Loading units in bad position introduces excessive wear and breakage which adds to their upkeep cost. To clean up the truck road with a bulldozer introduces delays which may be disturbing to the rhythmic movement of equipment and material. The solution lies in more frequent changes of shovel and truck loading points.

Modern shovels can change position quickly. With the proper team work on the part of the crew and a thorough understanding of the plan of procedure, there is little or no operation delay when the position is changed, providing the pit floor is clean and reasonably level. The condition of the pit floor is a result of the plan of procedure almost as much as it is the result of careful handling of the material.

When a new pit is opened, the road to and from the pit may be the factor which decides the choice of an operation plan. When sufficient room to operate has been gained a routine plan of procedure may be installed and as the work proceeds advisable steps taken to make the plan more efficient. Without a definite plan the operation may degenerate into haphazard practices.

When an old pit, from which considerable material has been removed, is re-opened, it is wise to disregard the methods previously used if they do not coincide with methods and plans which are known to produce better results. Frequently it is necessary to reshape an old pit to fit a better system. The truck roads in and out of the pit should be placed so there is the least amount of delay in truck spotting at the loading point. The exit road should take into account the fact that a "clean get-away" reduces the time necessary to shift gears on a loaded truck and get up momentum. The height of the digging face should be regulated so that the shovel can work to the best advantage.

Notes from the manufacturers

Coaltoter Conveyor Company, Chicago, has changed its name to Material Movement Industries according to Horton Conrad, Managing Partner. The change was made to more accurately describe the breadth of the company's equipment and activities in the material handling field. Material Movement Industries will continue to manufacture electric and gasoline engine-driven portable conveyors for handling bulk and packaged materials which are sold under the trade names Tote-All and Coaltoter Portable Conveyors.

Institute of Makers of Explosives, New York, N. Y., announces through Major C. Stewart Comeaux, Secretary-Treasurer, that it has moved its office from 103 Park Avenue to 343 Lexington Ave., New York City. The Institute, manufacturers of commercial explosives, blasting caps and fuse, had been in the Park Avenue offices for 30 years.

John A. Roebling's Sons Co., Trenton, N. J., announces that Ferdinand W. Roebling 3rd has been appointed Vice President in Charge of Engineering. He succeeds Charles M. Jones who was recently made Vice President in Charge of Public and Industrial Relations.

American Steel Dredge Co., Inc., Fort Wayne, Ind., states through Walter W. Walb, President, that J. C. Tyger has been appointed Sales Manager of the Dredge and Pump Division. Tyger was formerly midwest manager for Allen-Sherman-Hoff Co., Inc., Philadelphia, and has been connected with the dredging and material flotation industries for many years.

Front - End

LOADERS

For Industrial Tractors

Extensible Booms,
⅝-cu. Yd., Bucket 8-foot lift,
Backfiller Blades

White Mfg. Co.

ELKHART INDIANA

Caterpillar Tractor Co., Peoria, Ill., sends information that Carl O. Wold, Vice President of Caterpillar Tractor Co. and executive head of the Russell Grader Manufacturing Co. prior to its acquisition by Caterpillar, has retired. Wold is well known as a pioneer in the heavy construction machinery industry.

Gar Wood Industries, Inc., Detroit, has named Ross Miller manager of their Pacific Coast factory in San Francisco. Miller is a veteran of almost 26 years' service with the company.

R. G. LeTourneau, Inc., Peoria, Ill., has announced the appointment of Stanley D. Means to the newly-created position of Domestic Sales Manager. Means will have responsibility over all LeTourneau sales in the United States, Canada, Hawaii, and Alaska. His duties will include management of the Eastern, Central, and Western Sales Territories, and Governmental Sales, as well as continued personal supervision of Industrial Sales.

Frantz Tractor Company, Inc., distributors of industrial and construction equipment, have opened for business at 271 Madison Ave., New York 16, N. Y., and will act as New York distributors for Allis-Chalmers Mfg. Co., Sullivan Machinery Co., and Baker Mfg. Co. W. H. Frantz is president of the new firm and J. W. Morrissey is vice president. Mr. Morrissey was associated for many years with Bucyrus-Erie Co., in its New York sales office. R. W. Long, salesman for the new organization, was formerly associated with H. O. Penn Co. in New Jersey and Long Island and O. M. Brewster, another member of the sales force, was formerly with International Harvester Co.

The B. F. Goodrich Co., Akron, Ohio, has named W. F. Billingsley manager of tire construction. Billingsley was a tire testing and construction engineer for several years after joining the company in 1929 and was manager of tire testing from 1933 to 1941 at which time he was assigned to special tire development problems.

The Goodyear Tire & Rubber Co., Akron, Ohio, announced that E. T. Rainey has been named manager of Manufacturers Sales for their Western Division and that he will be located at Los Angeles. Rainey, former District Manager of Aviation Products Division for the company in Seattle, Washington, will be assisted by R. E. Bolton in the off-the-road, farm implement and agricultural machinery fields, while William Van Amerongen, located at Seattle, will contact the automotive manufacturers in the Pacific Northwest.

Iron & Steel Products, Inc., Chicago, dealers in used railway cars, machinery and equipment, announces the appointment of Mr. Charles A. Marshall as General Manager.

Pioneer Engineering Works, Minneapolis, has consolidated all of its service activities under Harold E. Rollin, Manager, Sales Engineering, in an effort to give efficient service to customers and distributors on all matters concerning operation of equipment in the field. Rollin joined the company in 1929 as a draftsman and progressed steadily upward, being named Manager, Sales Engineering in 1945.

The Timken Roller Bearing Co., Canton, Ohio, releases information that the company is testing a new method for making bearings metallurgically and geometrically more perfect in a "pilot" plant in Zoarville, Ohio, before adopting it on a factory-wide basis. The process has been used in making bearing parts in the miniature plant for the past two years.

Macwhyte Company, Kenosha, Wis., makers of wire rope, celebrated the golden anniversary of the founding of the company in conjunction with the tenth annual company-employe dinner recently. The more than 1,200 persons attending heard Jessel S. Whyte, president, speak briefly regarding the celebration. Other officers of the company reported on the past year's business and outlined plans for the future.

New trade literature

Title: **"35,000,000 is a World of Horsepower"**
Subject: The first complete story about the Series 71 engines manufactured for war use by the Detroit Diesel Engine Division of General Motors is told in this eye-catching booklet. Going back to the origin of the diesel engine, the booklet sketches General Motor's part in the development of the high speed 2-cycle engine and summarizes the uses of the G. M. Series 71 engines during the war.
Where to Get: Detroit Diesel Engine Division, General Motors Corporation, 13400 West Outer Drive, Detroit 23, Mich. (Free)

Title: **New Guide for Pipe Users**
Subject: A new 56-page catalog featuring applications of lightweight pipe in diameters from four to 30 inches. Installations showing the application of Naylor Lockseam Spiralweld Pipe are illustrated. Along with data on pipe structure are sections on precision fabrication and pipe connections including an entirely new type of coupling which saves time and labor for users.

(Continued on page 464)

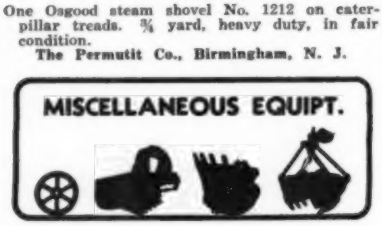
TO ADVERTISE: All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. If no change in copy is desired, three continuous insertions are offered for the price of two. Read these instructions carefully. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Count your own copy to save delay. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January issue closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

SMALL SHOVELS, CRANES AND DRAGLINES UP TO 2½ YDS.

One Osgood steam shovel No. 1212 on caterpillar treads. ¾ yard, heavy duty, in fair condition.
The Permutit Co., Birmingham, N. J.

MISCELLANEOUS EQUIPT.



50-B 2 yd. electric crawler type shovel.
Monighan 3 yd. electric and diesel drags.
40 Ton S.T. std. gauge steam locomotive.
45 Ton diesel-electric std. gauge loco.
Lima 1201 and P&H 7027 diesel cranes.
Drag scraper and slackline excavator eqpt.
RD8 Cat. tractor, with 12 yd. scraper.
Asphalt plants—various sizes and types.
Link-Belt K-55 fairleads; 6' radial drill.
James Wood, 53 West Jackson, Chicago 4, Ill.

One 45 ft. boom practically new, for Marion Model 125 shovel. Box 3161

The following equipment in good shape:
1 Northwest dragline, 1928, Model No. 4.
1 Page dragline bucket, 1 CY Type "C".
1 ¾ yd. Owen clamshell bucket.
1 C10 Buckeye ditcher with boom extension and spare parts.
1 No. 1 Buckeye ditcher with spare parts.
1 '27 Jaeger pump with hose.
1 Chicago air compressor.
1 LeRoy air compressor.
2 Air jack hammers.
2 Air spades with extra spades.
1 Air drill, hose and parts.
Ray E. Leininger, Administrator
Estate of G. E. Leininger
903 Wells St., Fort Wayne 7, Ind.

One 2 cubic yard heavy duty rock bucket for 50-B steam shovel. Used 2 weeks. Price $250. Located St. Paul, Minn. Box 3162

1—New 12-yd. L.P. LeTourneau Scraper.
1—Used 80 H.P. Crawler Cletrac
2—Used 7-yd. Continental Scrapers
1—Used 12-yd. Austin-Western Scraper
Box 3149

One complete set of 30" track links for Bucyrus-Erie 54-B shovel. Treads have had about sixty days service. Box 3155

B-Erie 1¼-yd. gas-air shovel, GA-3 rebuilt.
Bucyrus 50B and 80B steam shovels.
Marion electric shovels, 4, 3 and ⅞-yd.
Monighan 3-yd. electric walking dragline.
Porter, Vulcan 18-ton stm. locos., 36", reblt.
Whitcomb 8-ton gas locomotives, 24" ga., (4).
Steam locos., 29 to 50 tons, std. & 42" ga.
65-ton Diesel-electric locomotive, std. ga.
Cedar Rapids travel type asphalt plant.
Allis-Chalmers 27" Gates 12K gyratory crusher.
A-C Superior 54" x 24" crushing rolls.
Euclid 6-yd. bottom dump crawler wagons (8).
Hydroelectric gen. plant, 1000 KVA, 65' head.
25-yd. Diesel bottom dump truck-trailers (7).
Chicago Pneumatic compressor, Diesel, 300 HP.
Gold Placer Dredge, 7½', elec., wood, 28'.
B-Erie 52B 2-yd. shovel front attachment.
B-Erie 1¼-yd. shovel dipper; 40' crane boom.
H. Y. Smith Co., 828 B'way., Milwaukee 2, Wis.

Liquidation Sale at Falling Spring, Va.
(Located near Covington, Va.)

1—8 ton PLYMOUTH LOCOMOTIVE MODEL D.L.L. with Climax gasoline motor 42" gauge.
14—EASTON & ATLAS ROCKER DUMP CARS, 78 cable feet capacity 42" gauge.
3—KOPPEL DUMP CARS 4 yd. capacity with brakes 42" gauge.
1—OSGOOD STEAM SHOVEL, 1 yd. bucket Model 29 on caterpillar tractor.
1—BONNOT HAMMERMILL 30" x 36" Serial No. 40 belt driven by 75 H.P., G.E. slipring motor 3 ph 60 cycle 220 V 360 R.P.M. 186 Hmp Type I.
1—JEFFREY PULVERIZER 36"x24" Type 3 Serial 1899, Belt Driven by 100 H.P. Westinghouse slipring motor 3 ph 60 cycle 2200 V 700 R.P.M.
1—GYRATORY CRUSHER AUSTIN MFG. Co. No. 7½ shop No. 3093 driven by 75 H.P., G.E. slipring motor 3 ph 60 cycle 2200V 800 RPM.
1—ROTARY KILN 8' x 75'.
1—LINK BELT continuous single strand bucket elevator No. 730 chain, buckets —12" x 10", steel support 55' between centers.
1—LINK BELT continuous single strand bucket elevator bucket 12" x 10" about 75' between centers.
1—18" BELT CONVEYOR about 100' between centers.
1—WESTINGHOUSE A. C. GENERATOR 500 K.V.A. 2400 V 120, 5 Amps per terminal 3 ph 60 cycle 600 R.P.M. Serial No. 1231045.
Driven by a Pelton waterwheel with type P Pelton connected to Westinghouse DC generator (exciter) No. 80 L Type S.K. 13.5 KW 135 V 100 Amps 1050 R.P.M.
1—WESTINGHOUSE D.C. generator (convertor) N-750 Type S.K. 60 K.W. 550 V 91 Amps 1140 R.P.M. Serial No. 1321161 Driven by Westinghouse induction motor 75 H.P. 2200 V 19.08 Amps 3 ph 60 cycle 1140 R.P.M. Serial No. 1321045.

Hugo Neu, 31 Nassau St., New York 5, N. Y.
Phone Rector 2-1334

6B Smith gyratory crusher, complete with motor, starter and fuse boxes, like new.
Universal vibrating screen, size 3' by 8' single deck, perfect mechanical condition. Box 3154

For Sale —

SHASTA DAM SAND AND GRAVEL PLANT AND 10-MILE CONVEYOR EQUIPMENT

Including:
6000—36" AND 42" IDLERS.
Pulleys and Drives.
LATE MODEL 200 HP., 1800 R.P.M. GE MOTORS, complete with Starting Equipment.
Western Gear Reducers, 200 HP., 40 to 1 Ratio.
8 x 12 MARCY ROD MILL.
Dorr Hydroseparator.
30" Tripper and Trestle.
Merrick Weightometer.
All Types of Pumps, complete with Drives.
42" Pendulum Boom Conveyors, 100' and 200'.
Electric Line Equipment, Transformers, Motors and Supplies.
Other Miscellaneous Contractors' Equipment.

Subject to Prior Sale

Write, Wire or Telephone Redding 1440

COLUMBIA CONSTRUCTION CO., INC.
Box 579 Redding, California

FOR SALE — SURPLUS EQUIPMENT

30-B Bucyrus steam crane No. 4112, 55 ft. boom, fairleads and Page 1 yd. dragline bucket, light plant, equipped piledriving, extra high lift shovel front 1 yd. Spare parts.
41-B Bucyrus steam crane No. 4994, 50 ft. boom, 13 ft. jib, fairleads and 1 yd. dragline bucket, light plant, oversized boiler, equipped for piledriving, reconditioned late 1944. Spare parts.
2—¾ yd. Owen type J clamshell bucket.
2—No. 7 McKiernan-Terry hammers, flat anvils.
1—9-B-3 McKiernan-Terry round anvil. (NEW)
Metco metallizing unit complete, Type E-2 gun, hose, wire, shaft and air unit. (NEW).

JUTTON-KELLY COMPANY
13240 Alber Ave., Dearborn — Phone OR-8300 Michigan

---

1 Bucyrus-Erie 37-B shovel front complete with boom, dipper sticks and bucket with all parts as taken from 37-B machine 25018. Condition excellent. Box 3156

For Sale or Rent: Quarry in southern Lancaster County. Millions of tons above water level. W. F. Geiger, Quarryville, Pa.

½ YD. SHOVEL FRONT for Byers Model 60. Good condition.
Blazer-Jenkins Concrete Co.
Gallipolis, Ohio. Phone 480

One practically new 4 cubic yard type AX Bucyrus-Erie dragline bucket. Box 3145

Surplus Hydraulic Press Stock Available For Immediate Shipment.

4 Beco Portable Hydraulic Presses—100 tons capacity consisting of: Press cylinder (ram), 4 speed pump with high pressure globe valve, 5' 0" high pressure hose, 5' 0" oil return hose.
3 100 ton Press Frames, including:
1 Frame head
1 Cylinder back plate
4 Alloy steel back plate rods, 1"x20" with 8 nuts
1 Frame base with tie rods and nuts
4 Alloy steel frame rods 1"x48" with nuts
2 Extension sets, consisting of:
4 Sprocket lugs
4 Rod connectors
4 Extension rods, 24" with nuts
4 Extension rods, 38" with nuts
4 Extension rods, 48" alloy steel, with nuts.
1 Frame for track repair work consisting of:
1 Special back plate
3 Rods with nuts to attach press cylinder to track press frame
2 pcs. 10' 0" High pressure hose with fittings for 100 ton Press.
9 Pressure gauges

Bucyrus-Erie Company
South Milwaukee, Wisconsin

For Sale

3 Coleman dump trucks, 7½ yd. bodies—5 ton chassis. Excellent condition, perfect tires and spares. Many parts.

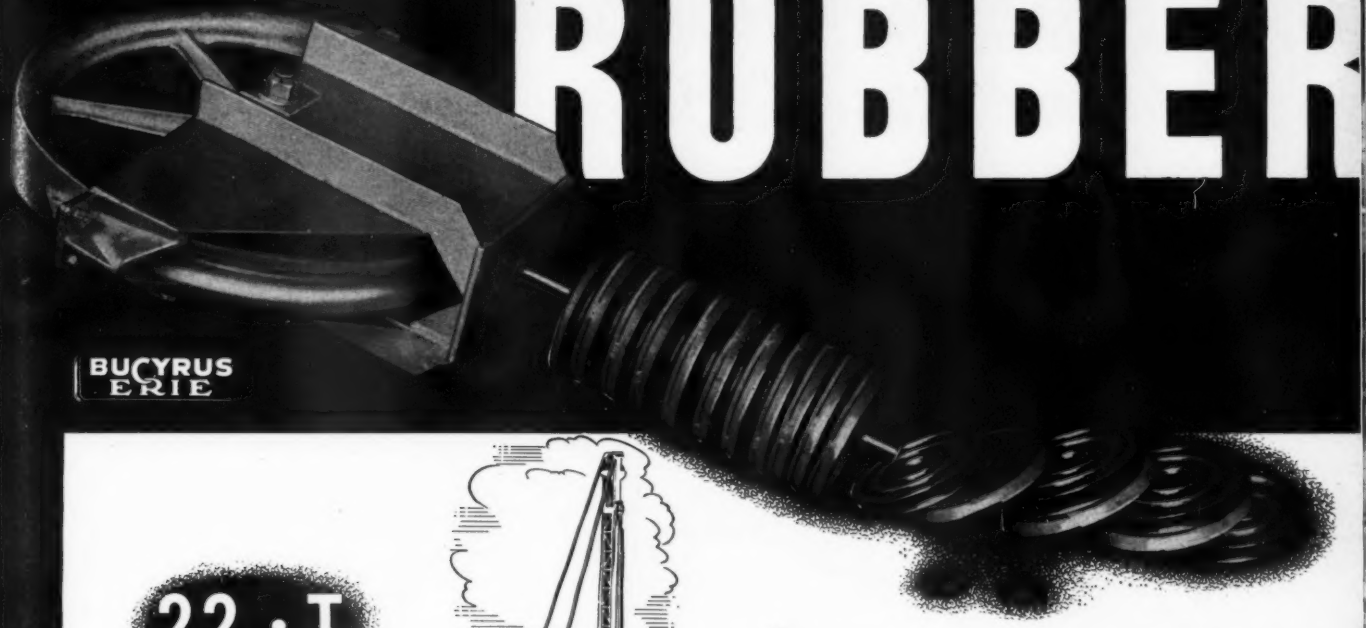
Magajupa Mining Company
220 West Third—Phone 3177
Joplin, Missouri

PRICED FOR QUICK SALE:

NORTHWEST DRAGLINE WITH 1¾ YD. BUCKET; FIVE BOTTOM-DUMP EUCLIDS, NINE YD. CAPACITY G. M. DIESEL POWER, EIGHTEEN INCH TIRES; ONE CATERPILLAR TRACTOR WITH LETOURNEAU BULLDOZER; ONE ADAMS MOTOR-GRADER, WITH 12 FT. BLADE, TANDEM DRIVE; THREE KOHLER LIGHT PLANTS. Will sell as a unit or will sell hauling equipment separately. Box 3144

(For Sale Continued on page 464)

RUBBER

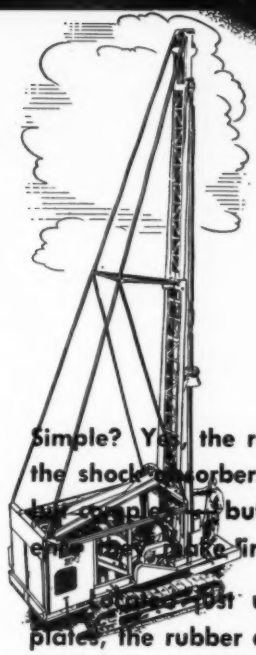


22 · T
5⅝" to 6⅝"
HOLES

27 · T
6" to 6⅝"
HOLES

29 · T
6" to 9"
HOLES

42 · T
9" to 12"
HOLES



that mean greater drilling footage

Simple? Yes, the rubber discs that are such important components of the shock absorbers on all Bucyrus-Erie blast hole drills are anything but simple — but don't let their simplicity fool you about the difference they make in drilling effectiveness.

Mounted just under the crown sheave and separated by steel plates, the rubber discs compress with each drilling stroke, permitting the tools to travel downward past the point where such travel would otherwise cease. Yet the instant the drilling blow is struck, rapid expansion of the rubber discs snaps the tools away from the bottom of the hole. Thus each blow is of the sharp, decisive type that produces the most shattering effect — and that means faster drilling progress, greater footage each hour, more tonnage prepared each shift. The rubber shock absorbers protect machine and cable from harmful shock, too, materially adding to the life of both.

There are plenty of other reasons why leading quarry and mine operators depend on Bucyrus-Eries for economical rock preparation. Let us tell you about them — and about the savings Bucyrus-Eries can bring to your pit!

12B46C

Bucyrus-Erie Company

SOUTH MILWAUKEE, WISCONSIN

For Sale

(Continued from page 462)

For Sale: Following equipment all located at Zap, North Dakota. May be inspected at any time.
3 Vulcan steam locomotives, 18 ton, 42" gauge.
2 Davenport steam locomotives, 21 ton, 42" gauge.
1 Whitcomb gas locomotive, 14 ton, 42" gauge.
10 18 ton roller bearing steel bottom dump hopper cars, 42" gauge.
1 Bucyrus-Erie GA2 shovel 1¼ yard coal bucket.
1 International TK40 gas caterpillar tractor.
1 1½ yard manganese lip ore shovel bucket.
1 1¼ yard manganese lip ore shovel bucket
1 3 yard Daniels Murtaugh dragline rock bucket.
1 Atlas Imperial 65 h.p. diesel engine.
1 Fairbanks Morse 20 h.p. diesel engine.
1 150 h.p. Bros steam boiler
1 Dryer, steam, 100 lbs. pressure, Capacity 20 tons material.

Approximately 325 tons railroad steel, 45 to 90 lbs.

Also large quantity angle bars, frogs, switch points, spikes, bolts, etc.

Address inquiries to:

DAKOTA COLLIERIES COMPANY
1017 Lumber Exchange
Minneapolis 1, Minnesota

3—Ford Grico tractors, two 95 H.P. motor each unit, 10 wheels. Excellent buy.

New York Trap Rock Corporation
230 Park Avenue
New York 17, New York

SURPLUS DIPPERS FOR BUCYRUS-ERIE SHOVELS

2—⅜ cu. yd. Skimmer Scoop Dipper—10-B.
2—½ cu. yd. Drag Shovel Dipper—17-B.
3—½ cu. yd. Skimmer Scoop Dipper—17-B.
1—¾ cu. yd. Welded Dipper—21-B.
1—1¼ cu. yd. Drag Shovel Dipper—38-B.
1—1½ cu. yd. Heavy Duty All Cast Dipper 42-B.
1—1½ cu. yd. type 4 Med. Duty Dipper.
1—2 cu. yd. Rock Dipper—75-B.
1—2¼ cu. yd. Inserted Type Dipper—50-B.
1—2¼ cu. yd. Inserted Type—55-B.
1—3½ cu. yd. Coal Loading Dipper—75-B.
1—4 cu. yd. Type IV Medium Duty Dipper 100-B.
F.O.B. Works

Write for any further information desired

BUCYRUS-ERIE COMPANY
Parts Department
South Milwaukee **Wisconsin**

"Building Construction Cost Data"
1946 (4th) Edition

A 72-page booklet of tabulated construction costs. 1150 Items broken down for labor and material. Arranged alphabetically and index cut A to Z. **Concise, Comprehensive** and **Up-to-date.** $1.60 Postpaid. R. S. Means, P. O. Box 62X, Duxbury, Mass.

ENGINEERS AND MECHANICS step up your own skill with the facts and figures of your trade. Audels Mechanics Guides contain Practical Inside Trade Information in a handy form. Fully Illustrated and Easy to Understand. Highly Endorsed. Check the book you want for 7 days' Free Examination. Send No Money. Nothing to pay postman.

- ☐ Marine, $4
- ☐ Machinist, $4
- ☐ Shipfitter, $1
- ☐ Radio, $4
- ☐ Diesel, $2
- ☐ Mathematics, $2
- ☐ Sheet Metal, $1
- ☐ Blueprint, $2
- ☐ Electricity, $4
- ☐ Welders, $1
- ☐ Plumbers, $6
- ☐ Carpenters, $6
- ☐ Auto, $4
- ☐ Refrigeration, $4

If satisfied you pay only $1 a month until purchase price is paid.

AUDEL, Pub., 49 W. 23rd St., N. Y. 10, N. Y.

EQUIPMENT WANTED

One (1) new D-7 Caterpillar tractor equipped with Angledozer and LeTourneau cable control. C. Martinique, General Delivery, Chicago Heights, Illinois.

POSITIONS WANTED

Operator desires electric shovel work. 7 years experience on Bucyrus-Erie 170-B. Can do shovel repair work. Will take foreign job if permanent. Single, 33 years old, in good health. Excellent references. Box 9261

New Trade Literature

(Continued from page 461)

Where to Get: Naylor Pipe Company, 1230 E. 92 St., Chicago 9, Ill. (Free)

Title: **Lubrication and Maintenance Guide for Contractors' Equipment"**
Subject: No effort has been made to include recommendations for individual pieces of equipment by make and model, but recommendations are made for the various power and other units which may be found in any given type of equipment. The information in this 72-page book is based on Gulf's cumulative experience gained from close-working association with equipment manufacturers and from contact with contractors' problems on construction jobs of all types.
Where to Get: Gulf Oil Corporation, 3800 Gulf Bldg., Pittsburgh 30, Pa. (Free)

Title: **"Rear Dump Euclid"**
Subject: Six-page folder features Model F Rear-Dump Euclid for off-the-highway hauling of earth, rock, ore and heavy excavation. Complete with illustrations and specifications, the folder is more complete than other bulletins it supersedes.
Where to Get: The Euclid Road Machinery Co., Cleveland 17, Ohio (Free).

Title: **How to Make Safe Wire Rope Fastenings**
Subject: A pocket size information card on the use and application of Crosby Wire Rope Clips.
Where to Get: American Hoist & Derrick Co., St. Paul 1, Minn. (Free)

Title: **Diesels with Endurance**
Subject: Durability and versatility of performance in construction work are highlighted in this new illustrated 24-page color booklet. The book represents an interesting portrayal of endurance marks by machines, some of which are no longer on the production line, but are still serving after 15,000 to 50,000 heavy duty hours.
Where to Get: Caterpillar Tractor Co., Peoria 8, Ill. (Free)

Title: **"Murex Electrodes"**
Subject: A ten-page booklet on underwater cutting and welding. The booklet describes the arc-oxygen process for the cutting of steel under water and for cutting cast iron and high alloy steels in the open air and gives considerable working data and procedure information. In addition, Murex Electrodes for welding and for cutting light gage materials under water are also covered and instructions for their use are included.
Where to Get: Metal & Thermit Corporation, 120 Broadway, New York, 5, N. Y. (Free)

Title: **Job-Proved for Profit**
Subject: An eight-page folder describing LeTourneau tractor equipment line designed to assist equipment owners and operators in the selection of proper tractor tools.
Where to Get: R. G. LeTourneau, Inc., Peoria, Ill. (Free).

Title: **"Belt Vulcanizers"**
Subject: Vulcanizing an endless gold dredge belt is one of the features in this catalog insert. The method is important as a new splicing and repair-maintenance solution to production stoppages when belts break.
Where to Get: B. F. Goodrich Company, Akron, Ohio. (Free)

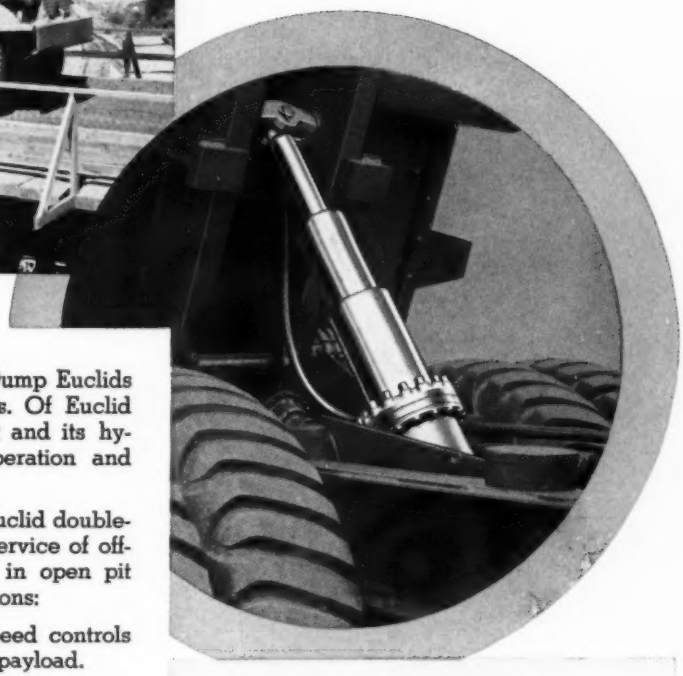
Title: **Building Construction Cost Data**
Subject: Containing average spot prices on 1150 items of building construction with 94 breakdowns on the more important units, this comprehensive 72-page booklet is index cut and concise. The tabulated price figures are up to date and provide a quick check for the man who already has his own figures and a definite quotation for those who do not have any classified costs on hand.
Where to Get: R. S. Means, P. O. Box 62L Duxbury, Mass., $1.60 postpaid.

Title: **"Hot-Mix Manual"**
Subject: The Hot-Mix Asphaltic Concrete Paving Manual is now available in four separate subdivisions as follows: Part I—Recommended Thickness Requirements for Hot-Mix Asphaltic Concrete Paving; Part II—Specification A-2-a Hot-Mix, Hot-Laid, Asphaltic Concrete Paving (Dense-graded Aggregate Type), Methods of Testing Mixtures, Job and Plant-Mix Formulas; Part III—Specification A-2-b Hot-Mix, Hot-Laid, Asphaltic Concrete Paving (Graded Aggregate Type), Methods of Testing Mixtures, Job and Plant-Mix Formulas; Part IV—Inspection of Hot-Mix Asphaltic Concrete Paving.

Specifications A-2-a and A-2-b are alternates and supersede former Asphalt Institute Specification A-2 for Asphaltic Concrete Surface Course (Coarse-Graded Aggregate Type) and Specification B-8 for Asphaltic Concrete Base (Coarse-Graded Aggregate Type).
Where to Get: The Asphalt Institute, 801 Second Ave., New York 17, N. Y. (Free)

Title: **"Amcoweld Lenses for Industrial Eye Protection"**
Subject: Four-page catalog describing welding lenses for goggles, helmets and handshields. The first presentation of its type, the folder gives complete descriptions as well as photographs of every type of welder's lens and industrial safety lenses for chipping and grinding operations.
Where to Get: Eastern Equipment Co., Willow Grove, Pa. (Free).

EUCLID *fast-acting* HOIST *Speeds Dumping*



THE three-stage hydraulic hoist of Rear-Dump Euclids saves time and reduces hauling costs. Of Euclid design and manufacture, the powerful hoist and its hydraulic system provide fast, dependable operation and ample capacity for the rated payloads.

Here are some of the features that make the Euclid double-acting hoist unequalled for the heavy duty service of off-the-highway work on construction projects, in open pit mines and quarries, and on industrial operations:

Raises Loaded Body Fast . . . Engine speed controls dumping speed; ample hoist capacity for full payload.

Dumps the Load Clean . . . Hoist has 37" stroke which raises body to 70° from horizontal.

Provides Complete Control of Body . . . Conveniently located hoist valve has four positions: raise, lower, float, and hold. All or part of the load can be dumped according to job requirements.

Lowers Body Quickly . . . Hoist is double-acting in third stage . . . lowers the body under power to the point where it settles quickly by gravity.

Ask your Distributor or Representative to show you how all Euclid models, Rear-Dump and Bottom-Dump, are built throughout for efficient, long life in off-the-highway service.

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

Wire rope "architect" at work ... for YOU!

To give the finished product maximum service, safety and economy, Macwhyte Wire Rope is carefully blueprinted by "architects" before any actual manufacturing starts. These men are Macwhyte's highly skilled design engineers.

Such things as size and quality of wires and strands, degree of flexibility, bearing surface, core, etc., must be accurately determined. The engineer's calculations must be perfect to produce a rope in which all parts fit uniformly and work together as a team to best meet operating conditions.

Proper designing is just one example of the thoroughness Macwhyte exercises at every step in planning and producing wire rope. No effort is spared to make it the *correct* rope for your equipment.

Ask for Macwhyte Wire Rope Catalog G-15

Contains 170 pages of valuable information; lists Macwhyte's complete line. Ask any Macwhyte representative or write Macwhyte Company.

Make Macwhyte your headquarters for Wire Rope and Slings

MACWHYTE WIRE ROPE

MACWHYTE COMPANY, 2903 Fourteenth Ave., Kenosha, Wisconsin

Mill Depots: **New York · Pittsburgh · Chicago · Minneapolis · Fort Worth · Portland · Seattle San Francisco · Los Angeles · Distributors throughout the U. S. A. and other countries**

★ ★ ★ ★

MACWHYTE PREformed and Non-PREformed Wire Ropes — Internally Lubricated . . . MONARCH WHYTE STRAND Wire Rope . . . Special Traction Elevator Rope . . . Braided Wire Rope Slings . . . Aircraft Cables, Assemblies and Tie-Rods . . . Stainless Steel Wire Rope, Monel Metal Wire Rope, Galvanized Wire Rope.

MACWHYTE COMPANY 50th Year 1896 – 1946

NO. 858